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Better Feeling Dominates

And Indicates Gradual Return to Prosperous Conditions—Considerable Foreign Business Placed and Pending

Sentiment continues to improve. Sales of pig iron made within a few days aggregate a larger tonnage by leading agents than during the entire month of October. In some cases, increased inquiry is undoubtedly due to a desire to sound the market, but there is reason for hoping that there will be a considerable increase in buying at a not far distant date. Many steel plants are operating at as low as 30 per cent capacity and the Steel Corporation has a smaller volume of orders in proportion to its capacity than at any time in its history. The prospects are, however, for a gradual resumption of business in finished lines as well as in pig iron. It is neither expected nor desired that the downward tendency, which has now continued for two years, will be suddenly reversed to boom conditions.

Pig Iron

Inquiries for pig iron include from 8,000 to 10,000 tons for delivery at the Alliance and Sharon plants of the American Steel Foundries, which within ten days has ordered 5,000 tons for delivery at other plants. An iron manufacturer at Troy, N. Y., has purchased 10,000 tons of forge iron for delivery from November to June. The sales made in the New York territory amount to about 15,000 tons.

Ferro Manganese

The confirmation of the report that the British government has prohibited shipments of ferro-manganese to this country indicates a determination on the part of Great Britain to prevent re-exporting to Germany and other countries now at war. The supply on hand is ample for the next few months, but considerable embarrassment would ensue if the embargo should be long continued or if improvement in the demand for steel should come suddenly and cause a large increase in the consumption of the alloy.

Machinery

Some additional orders for machinery for export are being placed, but the demand is not as active as during the past two weeks. Additional orders of importance are expected to be entered soon. Negotiations for steel barrels for export have resulted in an order for 25,000 being placed with a Cleveland manufacturer.

Railroad Buying

The letting of the contract for the substructure of a bridge at Sciotoville, O., for the Chesapeake & Ohio Northern railroad and the slight increase in activity in the buying of locomotives have furnished a little encouragement, but there is not yet any positive evidence of improvement in railroad buying. The Sciotoville bridge will require about 15,000 tons of steel which has not yet been placed. There is a possibility that Russia will place large orders for cars and locomotives in this country. The Chilean government is still negotiating for 250 light freight cars. Reports of negotiation by Russia for the purchase of rails involve large tonnages.

Finished Materials

An eastern plate manufacturer has taken a large number of orders in all parts of the country, but most plate makers report business very poor and prices weak. Prices on iron bars, particularly in the Chicago district, are soft and sales are being made at less than 1 cent per pound. Reports are also current of shading of prices on steel bars. Wire mills are operating at about 75 per cent of capacity and one-third of the product is being exported.

THE OPEN HEARTH

Time for a Rest

THE result of the congressional elections in reducing very decidedly the majority of the dominant party in the national House of Representatives and in almost eliminating the third party should have a sobering effect and check any proposed radical legislation that the administration may have planned to urge at the next session of the present Congress and the sessions of the new Congress. If both the old and new Congresses will content themselves by passing the appropriation bills and very little other legislation, the country will be grateful.

Some steps should, we believe, be taken toward scientific investigation of the tariff by a tariff commission. The great European war will show United States, as nothing else has done, how it can depend upon its own resources and what it can do to extend its foreign trade. The tariff is intimately related to all these questions and the fullest obtainable information is needed before the shaping of another tariff bill can intelligently be undertaken.

Quick Action Needed

AFTER reading the decision of the Interstate Commerce Commission and the dissenting opinion of Chairman Harlan in the industrial railways case concerning allowances to short lines of railroad serving industries, it seems clear that the difference of opinion disclosed by the two arguments relates to the method of solving a difficult problem rather than to fundamental principles. The decision of the commission declares that each of the industrial railways is or is not a common carrier and it promises to undertake to see that only just and reasonable allowances are made in each case. The decision holds that to enter an order would be to cause delay on account of the litigation which would follow.

In his dissenting opinion, Mr. Harlan expresses his opinion that an order should be entered, thus giving the courts an opportunity to review the questions in dispute. He believes that the failure of the commission to issue an order will leave important questions unsettled and in great confusion.

Time will determine what results the commission will obtain in going ahead with the plan which it has announced. The business interests of the country will hope that the plan will prove a great success. Certainly up to the present time the commission has not been noted for the speedy settlement of disputes. Let us hope that it will show in this case it can progress more rapidly than could be done by the court route.

Astonishing Industrial Waste

A PAPER of unusual interest and value was read by Magnus W. Alexander of the General Electric Co., Lynn, Mass., at the recent meeting of the National Machine Tool Builders' Association in New York on "Waste in Hiring and Discharging Men". At a time when many thousands of working men are idle and there is a possibility that unemployment will increase during the winter, the subject discussed by Mr. Alexander is especially important.

Mr. Alexander's discussion is based on an extensive investigation assisted by facts and figures given him confidentially by many companies. The disclosures made as to waste in increasing and decreasing industrial forces is indeed surprising. Mr. Alexander found that 72.8 per cent of all people taken on by the plants considered were entirely new employes and that correspondingly 22.2 per cent were re-engaged employes. Industrial managers with whom he talked assumed that the loss in unnecessarily hiring and discharging men is from $30 to $150 per employe. One machine tool builder said that he had engaged about 1,000 people the year previous in order to make an increase in his permanent force of only 50 for the year, and he felt certain that by this procedure $150,000 had been taken out of the profits of the business, a waste of about $150 for each discharged employe. The head of a large automobile factory stated that the engagement of a new employe costs at least, on an average, $100. Taking a group of factories,

THE OPEN HEARTH

Mr. Alexander found that the increase in the number of employes between Jan. 1 and Dec. 31 had been 6,697, and that the total number who had been engaged for that purpose was 42,570. Making allowance for all ordinary causes, he found that only 17,596 should have been engaged, and allowing in the neighborhood of 3,000 discharges or additional men hired due to conditions of production over which no one could have control, the total is brought up to 20,350. The showing that the hiring of 22,220 men could have been avoided, if proper methods and means had been applied, is indeed surprising.

The economic loss is divided by Mr. Alexander into clerical work in hiring labor, instruction expenses, increased wear and tear on machine and tools, and reduced production per capita. Mr. Alexander estimates that the employment of these 22,220 men unnecessarily meant an average loss of $35 per annum to the group of factories concerned, or an actual loss of $777,700 in one year.

As to how this loss of more than three-quarters of a million dollars can be avoided, Mr. Alexander believes that much can be done by a careful study of current employment statistics and an analysis of the reasons for the discharges, by placing a higher grade of men in charge of the hiring and discharging of employes, by applying proper methods of initiating new employes in their work and by introducing effective systems of apprenticeship or special training courses.

Mr. Alexander makes many helpful suggestions and dwells upon the fact that running through the whole subject is the man problem, which after all is the main problem. The study of human nature will help greatly in reducing the percentage of error in employing and discharging men. Employes generally are giving more and more attention to the subject and this winter are planning to keep employed as many men as possible, even if it becomes necessary to reduce the number of working days, or the hours per day. Some employers naturally have worked out this problem more satisfactorily than others and much could be accomplished by more frequent consultations and comparisons of methods. Surely nothing which promises to give more men employment and at the same time, by retaining old employes, to prevent loss to employers, should be neglected.

An encouraging sign of the times was the defeat at the recent election of the radical labor legislation proposed in Pacific coast states. The initiative and referendum are proving a disappointment to some of their most ardent advocates.

Saloons Near Factories

THE adoption of the so-called home rule amendment to the constitution by the voters of Ohio at the recent election will transfer 40 counties to the wet list because they were voted dry in past years under a county opton law which was repealed by the amendment. In order to prevent the opening of saloons in these 40 counties, it will be necessary to have many local elections, for under the new amendment the unit of voting territory cannot be larger than a township or municipality. Hence it is assured that during the next 30 days there will be a renewal with increased vigor of the contest between the wets and the drys in the Buckeye state. There are already indications that many manufacturers will take a decided stand in favor of prohibiting entirely the selling of liquor in the townships or municipalities where their plants are located and, if the wets win, will use their influence to prevent license commissioners from granting licenses to saloons located within 500 or 1,000 feet of manufacturing plants. While some may oppose prohibition and favor license, it is not at all probable that any manufacturers will wish to have saloons located near their plants. Hence, the time seems to be ripe for a revival of the "Push Back the Saloon" movement, which made considerable progress in Ohio until it was submerged in the state-wide prohibition campaign, which underwent defeat at the polls on Nov. 3.

The effort to keep the saloons away from plants is thoroughly in harmony with the "Safety First" agitation and is worthy of the support of all employers who have the welfare of their employes at heart.

Prices Present and Past

Quotations on leading products today, average for last month, average for three months ago and average for November 1913. Prices are those ruling in the largest percentage of sales at the dates named.

	Today's prices.	Average for Oct., 1914.	Average for Aug., 1914.	Average for Nov., 1913.
Bessemer pig iron, Pittsburgh..	$14.70	$14.85	$14.90	$16.09
Basic pig iron, Pittsburgh.....	13.45	13.75	13.90	14.09
No. 2 Fdy. pig iron, Pittsburgh	13.70	13.80	13.90	14.59
Northern No. 2 Fdy., Chgo....	13.00	13.50	14.00	15.00
Lake Superior Charcoal, Chgo..	16.00	15.75	15.75	15.50
Malleable, Bessemer, Chicago...	13.00	13.50	14.00	15.00
Southern No. 2, Birmingham...	10.00	10.00	10.13	10.50
Southern Ohio No. 2, Ironton..	13.00	13.00	13.38	13.56
Basic, eastern Pa.....	14.00	14.00	14.00	15.00
No. 2X Virginia furnace.....	12.50	12.50	12.50	13.00
No. 2X Foundry, Philadelphia..	14.50	14.50	14.75	15.50
Ferro mang., Balti.....	67.50*	68.00	100.00	50.00
Billets, Pbgh.	19.00	20.60	20.00	20.87
Sheet bars, Pbgh.....	19.50	21.00	21.00	21.75
Steel bars, Chicago.....	1.28	1.30	1.36	1.48
Steel bars, Pittsburgh.....	1.10	1.17	1.17½	1.31
Iron bars, Philadelphia.....	1.15	1.20	1.20	1.37
Iron bars, Cleveland, local del'y.	1.20	1.20	1.20	1.35
Iron bars, Chgo. mill.....	1.00	1.05	1.07	1.15

*Nominal.

	Today's prices.	Average for Oct., 1914.	Average for Aug., 1914.	Average for Nov., 1913.
Beams, Chicago	$1.28	$1.30	$1.36	$1.48
Beams, Pittsburgh	1.10	1.17	1.17½	1.30
Beams, Philadelphia	1.25	1.30	1.30	1.40
Tank plates, Pittsburgh.....	1.10	1.14	1.16	1.25
Tank plates, Chicago.....	1.28	1.30	1.36	1.43
Tank plates, Philadelphia.....	1.25	1.30	1.30	1.45
Sheets, blk., No. 28, Pittsburgh.	1.90	1.93	1.88	1.97
Sheets, blue an., No. 10, Pbgh.	1.40	1.40	1.37½	1.47
Sheets, galv., No. 28, Pbgh....	2.85	2.93	2.85	2.97
Wire nails, Pittsburgh.....	1.60	1.59	1.55	1.59
Connellsville fur. coke, contr...	1.65	1.67	1.80	1.81
Connellsville fdy. coke contr...	2.25	2.25	2.36	2.54
Heavy melting steel, Pbgh.....	10.00	10.75	11.50	11.00
Heavy melting steel, east'n Pa.	9.50	9.75	10.75	10.25
Heavy melting steel, Chgo.....	8.50	9.00	9.50	9.00
No. 1 wrought eastern Pa.....	11.00	11.75	12.25	13.50
No. 1 wrought, Chgo.....	7.50	7.75	8.75	8.75
Rerolling rails, Chgo.....	9.50	10.00	11.25	12.00
Car wheels, Chgo.....	10.00	10.50	11.00	12.50

(For Additional Prices See Page 930)

Much More Interest in Pig Iron

Numerous Inquiries for Basic, Malleable and Foundry, But Few Sales—American Steel Foundries in Market

Cleveland, Nov. 10.—The extreme dullness in the pig iron market which has prevailed for a number of weeks has been relieved by a marked increase in interest on the part of buyers of basic, foundry and malleable irons. The principal inquiry received in this district is for from 8,000 to 10,000 tons of basic for delivery at the Sharon and Alliance plants of the American Steel Foundries during the first half of next year. Smaller tonnages represent a considerable number of melters. Whether the inquiry is merely to sound the market or is seriously intended as a preliminary to considerable buying remains to be determined. So far, no sales of importance are reported and developments are awaited with much interest.

Better Demand at Chicago

Chicago, Nov. 10.—The American Steel Foundries is in the market for a round tonnage of basic and there is more inquiry for iron to be delivered during the first quarter and first half, but little buying is being done. No. 2 foundry is being sold at $13 to $13.50, Chicago furnace, and occasionally as high as $13.75 is obtained. The active presence in the market of steel companies offering iron of foundry grades at $12.75, furnace, is a disturbing factor and although the tonnage disposed of from these sources is not large, it is sufficient to have a decided effect on the market, as sales from this source form a large percentage of the business.

A better sentiment is evident and expectation of an improvement in business within a short time is generally held.

Southern foundry iron is not a factor in the northern market at present. With most sellers holding firmly at $10, Birmingham, it is impossible to deliver iron in Chicago and vicinity to compete with the local product. Rumors are heard of southern iron being sold under $10 and even as low as $9.50 is suspected as a possibility, but these rumors lack definite confirmation. Even at that level, southern iron is barely on a competitive basis for delivery in Chicago. Some dealers in southern brands have not made sales for a fortnight past.

Another northern furnace will probably be blown out shortly, leaving three merchant stacks operating out of 12.

Optimism Prevails

Birmingham, Ala., Nov. 9.—Market conditions in the Birmingham district are unchanged, with the exception that two or three furnaces have been blown out and the Ensley rail mills of the Tennessee Coal, Iron & Railroad Co. have closed for an indefinite period. Pig iron quotations remain at $10, No. 2 foundry, and practically any of the furnace men would shade that price for a reasonably large order.

There is a spirit of conservative optimism among iron and steel men, however, to the effect that the worst is over. Better conditions are approaching, they state, due to the increased exports, stimulus from the recent election, colder weather and the opening of the regional banks Nov. 16.

Feeling More Optimistic

Cincinnati, Nov. 10.—A more optimistic feeling prevails in the pig iron market and in a few instances dealers report better sales. A northern Ohio melter has purchased 1,000 tons of silvery iron, and another from the same territory has taken 600 tons of southern No. 2 foundry. A Michigan manufacturer has bought 1,000 tons of southern No. 2 foundry, and several smaller sales, ranging from 200 to 300 tons each, have also been placed in this territory. Most of this business has been secured more by

(*For complete prices see page* 930.)

solicitaion than from general inquiry. A melter at Quincy, Ill., is asking for 1,200 tons of southern foundry iron and another from Owensboro, Ky., is out for 500 tons of the same grade. A northern Ohio melter wants 1,000 tons of southern foundry iron and several small inquiries for charcoal iron of about 200 tons each are still pending for delivery into different parts of this territory. There is some doubt as to the inquiry for 10,000 tons of basic iron from the Portsmouth Steel Co., for while dealers here all state they are working upon it, no one apparently has received the original inquiry. An eastern broker is trying to purchase 4,000 tons of basic iron from furnaces in this territory, but very little interest is being taken in this inquiry.

Southern Ohio No. 2 foundry iron is being held at $13, Ironton basis, for spot or first quarter delivery, and it is rumored that the same price could be done for the first half in certain special instances, but no sales are known to have been made for delivery beyond April 1. Southern No. 2 foundry iron is quoted at $10, Birmingham basis, for the remainder of the last quarter and the first quarter of next year. The Sloss-Sheffield Steel & Iron Co. has blown out two of its furnaces, one at Sheffield and the other at Birmingham, Ala., and is now operating only two out of its seven stacks.

St. Louis Inquiries

St. Louis, Nov. 9.—There is a new inquiry for 1,000 tons of No. 2 pig iron out in the St. Louis territory, delivery over the first half of next year; the 1,200-ton inquiry from Quincy, Ill., reported last week, has not been closed, and another inquiry for a small tonnage of Lake Superior charcoal iron made its appearance this morning delivery over the first half of next year.

A better feeling seems to exist since the election, and local agents insist that confidence is all that is needed to restore the market to normal conditions. However, prices continue to drag, and furnaces decline to take on first half business.

Southern No. 2 is quoted at $10 to $10.25, Birmingham; northern at $13.50 to $14, Chicago, and $13 to $13.50, Ironton.

Pig Iron Marks Time

Pittsburgh, Nov. 10.—The Portsmouth Steel Co., which entered the market for 10,000 tons of standard basic for first half delivery last week, has not closed negotiations, so far as can be ascertained at this center. Several days ago, a small tonnage of basic was sold at $12.50, valley, and that figure generally is regarded as representative. Bessemer, quoted at $13.75, valley, is inactive. Foundry grades are moving slowly, and prices have not been severely tested. The Steel Co. of Canada, Ltd., plans to blow in one of its two idle stacks at Hamilton, Ont., next week.

Turn in Market Near

Buffalo, Nov. 10.—Furnace interests in the Buffalo district believe that the bottom has been reached and that the market is approaching the turn which has been hoped for for some time. Producers do not believe that prices will go any lower and they find indications in the character of the inquiry, although moderate at present, that point to the commencement of a reasonable upward movement of the schedules, based of course, upon the revival of operations to a greater extent upon the part of melters.

The immediate week's business showed no improvement. Sales for the district totaled about 6,000 tons and possibly more.

Eastern Pennsylvania Prices Soft

Philadelphia, Nov. 9.—Business in pig iron in this territory continues to be done along exceedingly narrow lines. New bookings are very light, consisting chiefly of lots to fill in the requirements to the end of the current year and inquiry is small and well scattered. The market in this respect is practically no different than it has been in several weeks. So sharply the output of eastern furnaces has been reduced, however, that the present dullness is causing no great change in the statistical position of the market. Stocks of iron among the furnaces represented in the Eastern Pig Iron Association increased somewhat in October and total orders also declined, but the difference was not large. The slight change in order books in part may be explained by the slow movement of basic. Large buyers of the grade are far behind in their specifications to makers and this will necessitate considerable tonnage originally bought for this year being carried into first quarter. One maker has cancelled an order for several thousand tons of basic from a central Pennsylvania steel maker which was not being taken out. A similar condition of declining orders and increasing stocks prevails in the Virginia market. The Thomas Iron Co. this week will blow in its second small Alburtis, Pa., stack, but the Alan Wood Iron & Steel Co. has decided to blow out its one active Swedeland furnace. Prices as far as developed by light buying show softness. The competitive market on Eastern Pennsylvania No. 2X remains around $14.50, Philadelphia, and Buffalo 2X at $14.45, delivered. There are reports that these figures may be shaded. A Philadelphia buyer who has opened negotiations for 1,000 to 1,500 tons of No. 2X for first half reports being able to do less than $14.45, delivered. Specialties have been responsible for additional total sales of 1,000 to 2,000 tons. The Virginia market is unchanged at $12.25 to $12.50, furnace, for No. 2X. There have been no further important developments in the low phosphorus market, which is quiet. It now is understood that $19, Philadelphia, was not the minimum in recent sales to steel makers in this territory.

Increased Rates at New York

New York, Nov. 10.—Efforts of salesmen to stimulate buying of iron without inquiry by offering consumers attractive prices, have borne considerable fruit in this territory and there has continued during the past week a selling movement of this kind which has covered a fair tonnage in the aggregate. These sales have totaled probably 15,000 tons and have been closed largely by Buffalo makers for delivery through the first quarter or slightly beyond at $12, furnace, or $13.75 to $14, delivered New Jersey tidewater points, and at $14.45, delivered in New England. In addition, there have been other round sales of Buffalo iron to other eastern points not embraced in the metropolitan district.

A Troy, N. Y., iron manufacturer bought 10,000 tons of forge iron at $12 from a Buffalo maker for delivery from November to June. Most of the sales made in this territory have been of the 1,000 or less class. A Hartford, Conn., machinery builder was a buyer of an additional lot of 1,000 tons. Open inquiry has continued small. A soil pipe maker has been negotiating for 2,000 tons or more of foundry and low grade iron for next year's delivery to its plant in Newark. The Erie and Lehigh valley railroads have out small inquiries. The New Jersey Zinc Co. and the International Steam Pump Co. have been buyers of small lots, the latter for Hazelton, Pa., and East Cambridge, Mass. In the foreign market, 2,000 tons of southern No. 2X for Genoa, Italy, have been asked for. Supplemental tariffs issued today extend the $3.25 freight on Virginian iron to all Boston common points in New England reached by the New Haven road. Sellers now are preparing petitions to have this rate apply to all the railroads which touch at these common points.

(For complete prices see page 930.)

Steel Barrels Ordered

For Export—Twenty-five Thousand Will Be Made in Cleveland

Cleveland, Nov. 10.—An order for 25,000 steel barrels for export has been placed in Cleveland. This inquiry has been pending for more than a month and it was feared it would not result in orders being entered, but some difficulties in the way were overcome. The sheet market is dull, with considerable uncertainty as to prices.

Some Steel Figuring

New York, Nov. 11. (By wire.)—Export houses here which have been figuring on an inquiry for 50,000 steel barrels for Russia are still negotiating for this business. High freights have been an obstacle in closing orders.

Sheets Continue Weak

Chicago, Nov. 10.—Weakness in the steel sheet market in Chicago, which was slow to appear, has not been lessened. Quotations last week of 1.99c to 2.09c, Chicago, for black sheets, continue to represent the market, although indications are that this minimum has been shaded in some instances. The shading appears to be on material for immediate delivery in this vicinity rather than applying to the market in general. Sheet mills are operating at a trifle better than 50 per cent, but without sufficient orders on the books to maintain this schedule for any lengthened period.

Lower Prices Offered

Pittsburgh, Nov. 10.—The steel sheet market does not appear so attractive as it did several weeks ago. Specifications against contracts have been falling off, and new orders have not increased in volume. At least one important maker is offering galvanized sheets at 2.85c for base size gage, or $1 a ton below the published minimum of a week ago. Black sheets appear firm at 1.90c. Mill operations have been reduced; some estimate average operations at between 50 and 60 per cent of capacity.

Still Droop in East

Philadelphia, Nov. 9.—The sheet market with eastern Pennsylvania makers has been duller than ever the past week. Bookings have declined further and makers have been obliged to make some additional retrenchment in operations. For this district, 1.55c, delivered, for No. 10 gage blue annealed appears well sustained, but in other territories going prices are on a lower level owing to the sharp contest for orders among the mills.

Sheet Prices Lower

Cincinnati, Nov. 9. — Sheet prices have declined slightly because of the continued cutting of quotations in surrounding territories. Black sheets No. 28 gage are quoted at 2.058c, and galvanized No. 28 gage at 3.058c, both Cincinnati basis. The market is a little better, and conditions are much more optimistic. Mills are shipping from stock in the majority of cases, as buyers are asking for shipments as quickly as possible. The Newport Rolling Mill Co. and the Andrews Steel Co., both of Newport, Ky., are again operating full force in all departments after a short shut down, and the American Rolling Mill Co., Middletown, O., is operating far above the average of last month.

American Billet Prices

As Named in Foreign Lands Vary Considerably —Foreign Inquiry Continues

Philadelphia, Nov. 9.—Advices from the British Isles reaching eastern Pennsylvania makers of billets, state that American steel of this grade is being offered to consumers at Manchester and other leading points at £4 15s or about $23.25 to $23.35, delivered. This is equivalent to about $19.50 to $19.75, eastern seaboard, this country or about $18 to $18.50, Pittsburgh. In other cases, however, eastern merchants quoting a higher price than that given, for delivery at leading English and Scotch ports were informed that prices were only a shilling out of line. Indications continue to present themselves that sellers in this country and British buyers have closely approached a common plane of prices in their quotations and offers, where an increased volume of business may be expected to result. Eastern Pennsylvania makers of billets, however, as yet, have taken only a few small orders. The inquiry for all forms of semi-finished steel for the British Isles and other foreign countries continues in considerable volume. Apart from some quiet transactions in this territory, some of them involving several thousand tons, there has been little action in the domestic billet market. Prices remain at $20.40 to $20.90, Philadelphia, or $19 to $19.50, Pittsburgh, for rolling billets and about $4 higher for forging steel.

Prices Untested

Pittsburgh, Nov. 10.—Semi-finished steel products show no snap, and there has not been enough selling to test prices. Bessemer and open-hearth steel billets are quotable at $19 to $19.50 and Bessemer and open-hearth sheet bars at $19.50 to $20.50, at the mill, Pittsburgh and Youngstown. Forging billets, makers advise, are being held at $25. Wire rods are named at $26, Pittsburgh.

Better Feeling at Ashland

Ashland, Ky., Nov. 9.—Wire rods and billets are unchanged in price, the former being quoted at $26, and the latter at $21, both Ashland basis. Conditions are unimproved, being very quiet, and sales are limited to small and scattered lots. The feeling is more optimistic, following better reports from surrounding territories.

(*For complete prices see page* 930.)

Chilean Ore

Arrives for Bethlehem Steel Co.—Effect of Closing North Sea

New York, Nov. 10.—Some interest is being shown in the eastern ore market as to the effect upon ore shipments to this country from Sweden, of the action of Great Britain in practically closing the North Sea to neutral shipping. This ore has been coming in to the Bethlehem Steel Co. and to the Reading Iron Co., but the reduced operations of these consumers probably would entail slight inconvenience should shipments be discontinued for some time. The steamer Oldfield has arrived at Philadelphia with another cargo of about 7,000 tons of Chilean ore for the Bethlehem Steel Co. The Ponupo Manganese Co., which recently sold a block of about 60,000 tons of low phosphorus and Bessemer ore, to an eastern furnace, as reported previously, has reopened its mines at Nima Nima, Cuba, which had been idle since early in the year.

The Van Dorn Mfg. Co., whose factory is at Chicago Heights, Ill., has moved its offices and sales rooms to 227 West Erie street, Chicago.

Foreign Ferro Shipments Stopped

By Order of the British Government—Effect of Embargo Will Be Serious if Continued—Supply for Few Months is Ample

New York, Nov. 10.—Foreign shipments of ferro-manganese to the United States have been shut off completely as the result of an embargo declared by the English government. Final confirmation of the accuracy of the reports of such action which had been current in the market for the past week, as stated previously in THE IRON TRADE REVIEW, has been made in cables from English producers just received by their agents and by leading consumers in this country. Even up to a day or two ago, it was thought by the representatives of the English makers that the report cabled a week ago to a Philadelphia merchant that an embargo had been laid was the result of some confusion, but developments Monday, when most of the additional messages were received, leave no doubt that this sweeping order now is in effect.

The advices received indicate that the ban on shipments by the English government, has been aimed primarily at re-export sales from this country to Europe, which it was suspected finally would reach consumers in Germany and other hostile countries. Representatives in this country of English makers now are obliged to guarantee the material is for consumption in the United States and the consumers are asked to assure that shipments received from these lots are for their own use, before several thousand tons of ferro-manganese afloat at the present time will be delivered. It will be recalled that recently several resale lots of ferro-manganese were sold in this country for delivery to Sweden and Australia and there have been other inquiries for European account.

The embargo on ferro-manganese shipments from England is the most serious event that yet has occurred in this market since the foreign sources of supply of this alloy were jeopardized by the war condition. Just how grave and far-reaching will be this effect will depend upon the length of time during which the barrier prevails. Consumers generally, in this country, particularly the steel makers, have good stocks on hand and have been accumulating considerable material from recent shipments. At the present rate of consumption, their supplies will fill their requirements for some months ahead. The pinch will be more keenly felt sooner, if the steel industry in this country shows any appreciable revival. England has been the only foreign source of supply for this country since the war began. With manganese ore shipments from India also under embargo and those from Russia shut off by the war, only the ore supplies of Brazil remain as a base for any increased production of ferro-manganese in this country. The free supply of Brazilian ore is reported to be small.

A fair tonnage of unsold ferro-manganese is understood to be in the hands of merchants and other sellers in this country and the market, as dominated by such material, is expected to show a sharp rise in prices. There has been some evidence during the past few days of the re-establishments of a firmer condition of the market after considerable shading on re-sale lots of the makers' official price of $68, seaboard. Several small lots were sold yesterday at $65, seaboard, to consumers who a few days previously were not interested in a price of $60, seaboard. Inquiry for ferro-manganese the past week has been a little more active, though in the aggregate has reached only a few hundred tons.

There is some demand for ferro-silicon. A Philadelphia steel maker asks 200 tons of 11 per cent. Some recent inquiries for 50 per cent and other grades of ferro-silicon have been received from England and other European countries. Australia still is in the market for a small lot.

Ferro Again Nerveless

Pittsburgh, Nov. 10.—The market for ferro-manganese in western Pennsylvania again is marking time. Resale lots have sold at less than $68, seaboard, according to unconfirmed reports, but dealers appear to be uniformly quoting that figure on new tonnage. No inquiry has come out for shipment after Jan. 1. Other alloys are unchanged in position.

Warehouse Business Steady

Chicago, Nov. 10.—Business continues about level with steel warehouses, although far below the average for this season. Structural work seems to be at a minimum and the principal item showing activity is plates for boiler work. Warehousemen look forward to an increase in business within the next 60 days, as conditions appear to indicate many things are ready to be put into active form as soon as a little encouragement is offered on the financial side.

Cincinnati Business Better

Cincinnati, Nov. 9.—Warehouse business is a little better, demand having increased for almost all materials carried in stock by local houses. Twisted concrete reinforcing bars continue to sell in good lots, as concrete contractors are rushing all work in order to have it completed before cold weather sets in. Prices show no tendency to change, but are a little stronger following the more optimistic trend that conditions have taken.

Coke Contracts

For Furnace Grades May Be Based on Sliding Scale

Pittsburgh, Nov. 10.—Buyers and sellers of blast furnace coke who got away from sliding scale contracts several years ago, now are considering that type of contract for 1915 shipment. Several tentative negotiations have been opened for first and second half delivery. Dealers are hesitating about offering flat prices for shipment after Jan. 1. Spot furnace fuel is quotable at $1.60. Foundry grades continue to sell at a wide range in price.

Market is Stationary

Cincinnati, Nov. 10.—The coke market remains at a standstill and prices are a little weaker, but unchanged following the slight decline last week. Certain grades of Wise county foundry coke are being held above present quotations, but some standard grades can be had from these fields at from $2.10 to $2.40, ovens. New River foundry coke is the highest in price in comparison with that from other fields, being quoted at from $2.50 to $3, ovens. New River furnace coke is also at the top price of from $2 to $2.25, ovens. Very little buying is being done, as both furnaces and foundries in this territory are well covered until after the first of the year.

Smelter Coke Inquiry

St. Louis, Nov. 9.—The 12,000-ton inquiry for smelter coke reported last week for delivery in the St. Louis market has not been closed, but agents who have the inquiry expected it to result in a sale soon. Connellsville and Virginia foundry grades continue to be offered at $2.50, ovens.

(*For complete prices see page* 930.)

Iron Bars Are Weak

Especially in Chicago District—Reports of Shading of Steel Bars Are Heard

Chicago, Nov. 10.—Continued weakness marks the situation in iron bars in the Chicago market and although quotations remain at 1.00c to 1.05c, Chicago mill, some tonnages are going at a shade lower. The leading interest continues to operate its mill practically full, but under the hand-to-mouth policy, which has prevailed for several weeks. Other mills are working intermittently and some have been idle for the past week.

Tonnages are small and scattered and no general business of an attractive nature is being received. Just how much shading of quotations is being done is difficult to determine, but it is almost certain from 50 cents to $1 per ton under the minimum can be obtained on attractive business for immediate delivery.

Shading Reported

Cleveland, Nov. 10.—Reports in the Cleveland district as to shapes, plates and bars are conflicting. While some sellers report a moderate increase in business, dullness is still the rule and frequent reports of price concessions are heard. One large independent company is said to have taken bar orders in this district at a cut price. The plate market is also uncertain, with 1.10c, Pittsburgh, as the usual quotation.

Lower Prices at Philadelphia

Philadelphia, Nov. 9.—Lower prices on bar iron have come out as the result of the keen quest of orders by makers, and 1.05c, mill, or 1.12c, Philadelphia, now is understood to be available. Some iron mill capacity is resuming after an accumulation of orders, but there is no actual improvement. The Reading Iron Co. has started some puddling furnaces and the E. & G. Brooke Iron Co. has started up its nail plant at Birdsboro.

Signs of Improvement

Buffalo, Nov. 10.—The mills and agencies of the Buffalo district are of one accord that the sentiment of the market shows signs of improvement. Some interests look for a resumption of trading to a considerable extent with the opening of the new year. Ordering is light, but there is an increasing frequency in the small lot inquiries. It is believed that the effect of the operation of the Federal Reserve banking system will ease the money market and result in a business improvement.

Producing interests are quoting 1.15c base on bars and shapes, while it is believed that desirable tonnages and immediate specifications could be closed at 1.10c, base. Some of the smaller eastern mills, producing plates only, it is said, are quoting below 1.10c. Sales of all lines are confined largely to early needs and little interest, so far, has materialized for material wanted after the first of the new year.

French Inquiry Pending

New York, Nov. 10.—The inquiries of the French government for 25,000 to 30,000 tons of 3¼-inch rounds for shrapnel, which have been pending in this territory, still are unclosed. Different makers are competing for this business. There have been some reports in the market that a round lot of these bars has gone to an eastern Pennsylvania mill, but these are not confirmed. Some other quantities of shrapnel bars for foreign countries are being talked about in this district. The 1,000 tons of reinforcing bars for the Portland, Me., bridge, still are pending. Apart from the negotiations by foreign buyers, the bar market remains slow. A good tonnage probably would be done at 1.26c, New York, or 1.10c, Pittsburgh, but some small sales still command $1 higher.

Dull and Weak in East

Philadelphia, Nov. 9.—The steel bar market in eastern Pennsylvania is showing no noteworthy change. Small tonnages continue to represent the extent of new business and these usually are being made the object of very keen competition. There is no longer any doubt that 1.10c, Pittsburgh base, or 1.25c, Philadelphia, is appearing more generally on desirable business. A lot of slightly over 100 tons of 1⅝-inch special rounds for the Chesapeake & Ohio railroad which went to a Pittsburgh maker produced considerable price irregularity and was sought for sharply. An inquiry for 300 tons of high carbon bars for an Eastern Pennsylvania steel maker remains in the market. Bar specifications are slow. Howe & Samuel, Danville, Pa., rolling special bars expect to resume operations in December.

Steel Bars are Quiet

Chicago, Nov. 10.—Although an improved sentiment has resulted from political conditions and a generally better tone is evidenced in the trade, this has not been translated into actual orders to a sufficient degree to give great encouragement. However, there is an increase of inquiry for steel products and some addition to the volume of business during the past few days. While agricultural implement makers are not taking as much tonnage as usual, there has been a slight increase recently, which is a matter of some encouragement. The quotation remains 1.25c to 1.34c, Chicago, the maximum being obtainable for small lots and the minimum on business for strictly prompt Chicago delivery, with attractive specifications.

(*For complete prices see page* 930.)

Hoops, Bands, Shafting

Pittsburgh, Nov. 10.—While the most important makers of cold rolled shafting are quoting at 66 per cent off list, expressions are heard that an attractive tonnage could be obtained at $1 a ton under that figure. The market continues dull and inactive. Hoops and bands are quiet, and prices are uncertain.

Wire Mills

Operating at About 75 Per Cent—Foreign Business Helps

Pittsburgh, Nov. 10.—Were it not for activity enjoyed by manufacturers of wire product, the entire iron and steel market would present a decidedly gloomy appearance. Wire mills are operating at about 75 per cent of capacity, and present schedules probably will be maintained until the end of the month, at least. About 25 per cent of the tonnage produced in western Pennsylvania and eastern Ohio is being delivered to belligerent nations.

More Foreign Orders

Cleveland, Nov. 10.—Orders from foreign countries for barbed wire are still adding to the volume of business of the wire companies, whose plants are much more active than any other concerns turning out finished material. Manufacturers continue to specify more liberally and prices are being well maintained.

Wide Range of Tin Plate Prices

Pittsburgh, Nov. 10.—Tin plate continues to sell at wide ranges in price. Some mills in need of additional tonnage have offered material at 3.15c, while others are quoting at 3.40c. Strength reflected by pig tin may have a beneficial effect upon the market for tin plate. Makers have not opened books for 1915 shipment.

Foreign Scrap Inquiry

Interests the Eastern Market—Italy Would Buy Car Wheels and Heavy Melting Steel

Philadelphia, Nov. 9.—Exportation of iron and steel scrap from this territory to Europe is now receiving increased attention as the result of inquiry from Italy for car wheels, and heavy melting steel. Freight rates quoted upon such deliveries, however, have been so high that they have been practically prohibitive, although the Italian market now is at a fairly favorable exporting level on the basis of normal carriage charges. Heavy melting steel there is quoted at 55 shillings or approximately $13.50, delivered. Eastern merchants now are following closely these export inquiries. Demand for old material in this territory does not improve and the market still drags. Consumers mainly are indifferent despite the very attractive prices and are not coming into the market freely, although they are taking in a certain amount which sellers are forced to move. The October railroad lists went at lower prices, the No. 1 steel around $9.35, delivered, the car wheels at $9, delivered, and the No. 1 railroad wrought at $11 to $11.50, delivered.

Still Low at Pittsburgh

Pittsburgh, Nov. 10.—Inability to hold the market at quoted prices has caused considerable pessimism among sellers of iron and steel scrap. Material is being obtained at the lowest figures recorded in many years, but buying is confined to small lots, despite weakness. Heavy melting steel is quotable at $10. Other grades are correspondingly weak. Jobbers do not hope for a change in the situation until after finishing mills enjoy greater activity.

Prices Soft

Buffalo, Nov. 10.—The old material market of the district continues absolutely dull with prices softening to the lowest level in recent years. There is little or no trading in any of the lines and dealers report no interest on the part of consumers.

Shipments Held Up

Cleveland, Nov. 11.—Inasmuch as all of the main mills in the district are holding up scrap shipments, the scrap market is displaying little activity. About the only encouraging sign is a negative one—prices have not moved in the past week, while a downward tendency had been in evidence during each of several preceding weeks. Heavy steel scrap continues to be quoted about $8.50 to $9.25, the maximum being for the best grades of shop steel. Dealers say that mills are reluctant to place any orders for material, owing to the approach of the year-end inventory, following a year of poor results at best. In the valleys, conditions similar to those in the Cleveland district exist, plenty of old material at record low prices being available, with takers few and far between.

Scrap Still Declines

Chicago, Nov. 10.—Declines in various items of scrap in the Chicago market were registered during the past week, although some lines are holding at former quotations. As a matter of fact, comparatively no business is being done and prices are largely nominal, although the occasional transaction gives a clew to the market.

Railroads continue offering tonnages, the C., St. P., M. & O. having out a list of 1,600 tons, which includes 300 tons of steel rails; the Illinois Central 2,400 tons, the Southern Railway 6,700 tons, and the Wabash 1,400 tons.

Railroad Lists

St. Louis, Nov. 9.—Scrap lists put out by the railroads at St. Louis to be closed this week are: Wabash, 1,500 tons; Wabash, 6,000 tons of relayers; M. & O., 800 tons scrap; K. C. Southern, 250 tons; Vandalia, 300 tons; M., K. & T., 2,500 tons; Southern, 3,000 tons. Prices are unchanged from last week, but the indications are that they will go lower.

Machine Cast in Demand

Cincinnati, Nov. 9—A slightly better demand for No. 1 machine cast is still noticed, as a few foundries in this city are busy supplying castings for lathes, for which heavy orders have been received recently from Europe by machine tool manufacturers. This material is unchanged in price at from $8.50 to $9 per net ton. All other grades of scrap are barely moving, and what little old material is being sold is going to melters outside of this city. Prices are unchanged in all instances.

Some are More Cautious

New York, Nov. 10.—Some scrap dealers profess to see a little better outlook for the market and are more cautious in taking orders at the present low prices. At the same time, the buyers are doing little and the market is listless. Some reports of orders taken for heavy melting steel below $9.50, delivered eastern Pennsylvania, continue to be heard, but are not generally credited, though some small lots forced on the market have gone below that figure. Sellers state they could take on good orders at $9.50, delivered, if they were so minded. There continues to be some covering in this district of old $10, delivered, orders for steel, at prices ranging from $7.45 to $7.60, New York. Cast is off. Leading Jersey buyers are offering only $10.25, delivered, for heavy cast, while a lot of very special No. 1 machinery went at $11.50, Jersey City. Shafting and steel axles are lower.

(*For complete prices see page* 930.)

Cast Iron Pipe

Is in Better Demand in Some Sections —Order From Havana

New York, Nov. 10.—A larger tonnage of cast iron pipe has appeared in the market the past week and the outlook for future buying is somewhat more promising. Conditions in no respect, however, are approaching normal and the inquiries from municipalities remain few. Prices still are weak and hang to low figures. The Standard Cast Iron Pipe & Foundry Co. took 1,300 tons of 30-inch for Troy, N. Y., at $19.53, delivered, or $17.13, at the foundry. Woppingers Falls, N. Y., will open bids Nov. 18 on 680 tons of 4 to 10's. Gas companies around Boston are in the market in a more liberal way. The Boston Consolidated Gas Co., the Citizens' Gas Light Co. and the East Boston Gas Co. have out inquiries totaling 3,100 tons. The Newtown and Watertown Gas Co. asks 1,500 tons of 4 to 12's. The Metropolitan Water Board of Boston is expected to come out in the near future with a requirement of 7,000 tons of 60's. In export, the National Cast Iron Pipe Co. has taken the order for 1,070 tons of pipe and specials for Havana. An inquiry for about 4,000 tons for Santos, Brazil, still is showing life.

Few Pipe Sales Made

Chicago, Nov. 10.—Dullness continues to characterize the market for cast iron pipe in Chicago and the season is remarkable for the lack of rush orders by municipalities completing their season's extensions. Inability to finance bond issues is regarded as the reason for this slackness in demand. The Glamorgan Pipe & Foundry Co. has been awarded 50 tons at Hammond, Ind., and the National Cast Iron Pipe Co. obtained the contract for 300 tons at Duluth.

Plate Orders Improved

In Eastern Territory for a Few Days—Sentiment Generally is More Cheerful

Philadelphia, Nov. 9.—Some eastern Pennsylvania plate makers entered orders in a large volume for a few days last week, one of them taking more than 60 different lots on a single day, aggregating a fair tonnage, but there does not appear to be any important change in the general quietness of the market, beyond some improvement in sentiment. Railroad tonnage still is extremely light, though locomotive builders in this district are doing a little better and are bidding on a larger quantity of prospective work. A vessel to require 2,000 tons of plates is being figured by eastern yards. Scattered foreign inquiries continue to come in, but orders from such sources are of no considerable volume. Plate prices are quoted at 1.25c to 1.30c, Philadelphia, or 1.10c to 1.15c, Pittsburgh. The plate mill of the Alan Wood Iron & Steel Co. again is idle.

Defers Car Float Award

New York, Nov. 10.—The Lehigh Valley railroad, which has been taking figures on three car floats requiring about 2,000 tons, principally plates, has deferred action upon this matter temporarily. Bids were taken this week by the government on six torpedo boat destroyers, requiring several thousand tons. Plate orders in this district usually run in small amounts. For any attractive lot, there is keen competition among the mills and prices are soft. Any considerable order is bringing out 1.26c, New York, or 1.10c, Pittsburgh.

Plate in Better Position

Chicago, Nov. 10.—Steel plates, which have been the weakest finished steel product in this market for some time, recently have been a trifle more active than shapes and while tonnage is small, it is encouraging to producers and leads them to believe a slight improvement is taking place. The inquiry is not sufficient, however, to bring about a change in quotation, which remains more or less nominal at 1.25c to 1.34c, Chicago, the minimum being for local delivery.

Finished Lines Low

Pittsburgh, Nov. 10.—Manufacturers of hot rolled products, including plates, shapes and bars, are running plants at about 35 per cent of capacity, or 5 per cent below the average 10 days ago. Operations at many mills now are at the lowest point in many years. Despite improvement in sentiment the last seven days, there is no perceptible change in the market. Material is being held at 1.10c, Pittsburgh, but reports of the Pittsburgh basing price being shaded at other centers are heard. While it is believed rock bottom will have been reached within the next few weeks, mill managers do not look for tangible evidence of improvement until after Jan. 1.

Russian Railroad Buying

May Help the American Rail Mills and Car Builders —Domestic Demand Light

New York, Nov. 10.—Buying of locomotives has been somewhat enlarged and builders now are figuring on an increased number of inquiries, some of them calling for a considerable number. The change in the market is a very modest one, however. The American Locomotive Co. in October entered orders for about 30 locomotives, as against four or five each during September and August. The Big Four has released 12 locomotives to this builder and the Tata Iron & Steel Co. has ordered two. The Baldwin Locomotive Works also has been booking small orders more freely. The Maine Central is inquiring for seven and the Delaware, Lackawanna & Western has five in view. Russia still continues a prospective buyer of both cars and locomotives. Some reports give the quantities in view as large, calling for several hundred locomotives and 2,000 to 20,000 cars.

Car orders, however, show no improvement, and make a strikingly poor showing. Orders closed in October, according to a record of confirmed awards by builders, reached the pitiful total of only 43. About 125 coaches remain in the market. The Pressed Steel Car Co. has taken 24 coaches for the Union Pacific railroad. The Chilean government railways still are negotiating for 250 light freight cars.

Rails continue slow. Total orders in October were only 30,000 tons, bringing the reported awards this year to date to 1,080,000 tons. The Lorain Steel Co. has taken 1,000 tons of girder rails for a traction road in southern California, which was closed at New York. The Pennsylvania Steel Co. received 250 tons for a New England traction line.

The Chesapeake & Ohio Northern, which has been organized to build a 94-mile line in Ohio connecting the Chesapeake & Ohio and Hocking Valley roads, is expected soon to be in the market for about 10,000 tons of 90-pound rails. The negotiations now being carried on by Russia for 67-pound rails, in addition to 10,000 tons of 20-pound sections, calls for a large amount which some reports state may reach 100,000 tons.

Light Rails Irregular

Pittsburgh, Nov. 10.—Irregularity continues to feature the market for light steel rails. Eight and 10-pound rails are listed at $1.275; 12 and 14 at $1.225; 16 and 20, $1.175, and 25, 30, 35, 40 and 45-pound sections at $1.125 per 100 pounds, or about $2.50 a ton less than the previous nominal quotations. Standard sections are unchanged in position. Specifications continue light and no new orders of importance are being placed.

(*For complete prices see page* 930.)

Tubular Goods Quiet

Pittsburgh, Nov. 10.—Iron and steel pipe has been inactive this week. Steel pipe is being uniformly quoted at prices mentioned in THE IRON TRADE REVIEW for Nov. 5. There has been no change in quotations for iron pipe or boiler tubes. Boiler tubes show no snap, and prevailing discounts are irregular.

Nuts, Bolts and Rivets

Pittsburgh, Nov. 10.—Nuts, bolts and rivets continue to sell at wide ranges in price. Rivets are quotable on the basis of 1.45c for structural. Nuts and bolts are weak and irregular. Demand for all three products is light.

The Massillon Electric & Gas Co., Massillon, O., is issuing $75,000 worth of one year 6 per cent collateral trust notes, to provide part of $100,000 required for increasing equipment and enlarging its plant in order that it may supply power to the Central Steel Co. and the American Stamping & Enameling Co. works, both now under construction at Massillon, and to the Massillon Rolling Mills.

No Use for Industrial Traitors

Say British Workingmen in a Remarkable Appeal—Steel Arrows a Unique Product for Use in War

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, England, Oct. 26.

The general situation in regard to the war continues favorable, although a terrific struggle in northern France is still raging. The heavy cannonade can now be heard from the British coast, at Dover. But the probability of invasion does not increase—rather the reverse, and traders are in better nerve. The general trade continues to improve, and, in fact, this is the principal reason why the latest appeal of Lord Kitchener for more recruits is not succeeding so well as its predecessor, two months ago. The men now are wanted in the works, and employers are not, therefore, applying the threat of dismissal to provoke young fellows to enlist. Cotton and jewelry are the worst hit in the matter of unemployment; but jewelers are doing better than they were, so that the Birmingham assay office, which has been half-closed, is working fully five days a week. The government returns of unemployment for last week showed a total out of work in engineering, ship building, vehicle-making, works of construction and building of 4.46, as compared with 4.80 a week ago, and 5.79 a month ago. Even the women workers are now better employed. Freights and bankers' clearings also point in the same direction. Engineers generally are very busy. Government orders are still coming along in good volume.

A remarkable circular has been issued by the executive committee of the Associated Iron and Steel Workers of Great Britain, entitled "Our Duty During the War". As to the interests involved the writers say: "Its effects are, we fear, too little realized. Either we must win, for the triumph of political freedom, or be crushed by a military despotism, beneath whose heel all industrial freedom will be utterly destroyed."

Having paid a tribute to the thousands of fellow-workmen who are fighting, the letter continues: "We also who remain have our great fight, and that is to capture, as far as we can, the German iron and steel trade, built up by unfair, underhanded and unscrupulous methods. The German nation would not only crush our army, but would crush and cripple our industry. That is their aim. To beat them in the industrial fight is the great privilege of every industrial worker who stays at home. Now is the time, and now the opportunity, which may never occur again." This industrial struggle, it is maintained, is equally great with the military, and the letter concludes—"No throwing down tools! Suppose Tommy threw down his rifle? No stopping away from work! Tommy does not stop away from the fight. He is eager to be in it. We must be out to win. There is no room at the front for 'Weary Willies'; and 'Tired Tims'; they take care not to go. If we find them in our ranks at home, don't let them scotch our fight. They are industrial traitors—make it hot for them."

Pig Iron Stagnant

The tone of the raw material department is flat and nearly stagnant. It is remarkable that nothing like this depression prevails in the finished departments, and this suggests the general inference that the reaction is merely the disappearance of inflated conditions. Prices have now fallen back to about 5s ($1.20) a ton since war was declared. Consumers are expressing their satisfaction, because they have found that the high prices of pig iron handicapped them very considerably in their efforts to secure German business. With the steady broadening out of orders, makers are very hopeful that buying will recommence shortly; but the consumers are naturally making the most of all bearing conditions to get rock bottom prices. Saturday's quotations for Middlesbrough warrants were 49s 5d ($11.86), and for three months 50s ($12), while stocks, which are still increasing, stand at 106,000 tons. There is still talk of blowing out furnaces to prevent accumulations, but smelters are reluctant to increase unemployment. Makers are not generally following the reduction in warrants, but they pay for their firmness by a lack of business. The increase of stocks during the month is less than 1,000 tons, so that this is not a very serious matter. The East Coast hematite business has been slightly easier. Apparently, there is plenty of ferro-manganese, and prices are easing considerably. Quotations for East Coast hematite mixed numbers are 63s 6d ($15.24) for prompt or forward delivery. In the Barrow district, there is very little buying, but the very large consumption keeps the market steady, and special brands are in good request. Business on that side of the country is much less menaced by shipping dangers than on the East Coast. It is generally agreed that North Sea dangers have very much to do with the poor state of Cleveland trade. It is specially unfortunate because the shipping season on that area has now practically run its course, and there is always some stocking of material during the winter. There is increasing keenness for orders among the smelters of Staffordshire, Derbyshire and Northampton.

Finished Materials Improved

The tone in the finished department has undoubtedly improved during the past week, although most mills could do a lot more business. Sheffield continues to benefit by the capture of a certain amount of German business. In fact, more orders have been secured during the last week than in any period since the war. The well-known firm of Kitson & Co., Ltd., have just secured an order for 16 locomotives for the South Indian Railway Co. That order had been placed, prior to the war, with Messrs. Henschel & Son, of Cassel, Germany. On the outbreak of hostilities the contract was cancelled, and as the result of subsequent tenders the new order has been placed in Leeds. The locomotives are to be delivered between March 31 and May 31 next. Another recent capture is a rail contract of 20,000 tons placed with Messrs. Guest, Keen & Co. The order is for South African railways. Other fairly good inquiries are in the market. Sheffield makers are keeping their rolling mills busy, and are booking orders much faster than they are being executed. A number of Russian orders formerly executed in Germany have been picked up. In special steels better orders are reported from America. The most unsatisfactory buyer is South America. The Clyde ship builders as well as those on the Tyne and Tees have placed orders for marine castings, formerly obtained from Germany. The temptation in the past has been the extremely low price quoted by the Germans, and the new business, according to present quotations, will cost the buyers quite 50 per cent more than the German castings. Builders of rolling stock generally have taken

useful contracts from the India office and several of the home railways.

A peculiar result of the war is the production by several Sheffield firms of large quantities of steel arrows. The principal buyer is the French government. The arrows are about 4½ inches long, pointed like a lead pencil, and they are so shaped as to fall point downwards. They are intended to be dropped from aeroplanes upon the heads of the enemy.

Another Ford Plant

Buffalo, Nov. 9.—The Ford Motor Co., of Detroit, has purchased a site and is to erect in the spring a four-story building, representing fully $500,000, for land, construction and equipment, for the purpose of operating here a branch assembling plant, repair shops, sales rooms, garage space and offices for the Buffalo district of the Ford Motor Co.'s business.

Will Make Tool Steel

The Becker Steel Co. of America which recently purchased the plant of the Baldwin Steel Co., Charleston, W. Va., hopes to begin operations around the first of the year. The company will manufacture high grade tool steel, ball bearing steel, seamless tool steel, and similar products by both the crucible and open-hearth processes. It also will import electric steel billets for further rolling.

Reduced Plant Activity

Chicago, Nov. 10.—Open-hearth operations at the Gary plant of the Illinois Steel Co. have been reduced to 12 furnaces out of 42, or 28 per cent of capacity. The leading interest has 10 blast furnace stacks operating out of 25, which is 40 per cent of its capacity. The immense coke plant at the Gary works is operating at about 50 per cent of capacity.

Lake Erie Ore Receipts

Out of total shipments of 4,242,392 gross tons of iron ore during October, 3,526,795 tons went to Lake Erie ports, distributed as follows:

Port.	October, 1914.
Buffalo	397,679
Erie	10,758
Conneaut	966,995
Ashtabula	628,161
Fairport	216,613
Cleveland	750,858
Lorain	283,602
Huron	64,898
Sandusky	.....
Toledo	158,382
Detroit	48,849
Total	3,526,795

Steel Plant

Finishing Mills and Coke Plant Will Be Built

Buffalo, Nov. 9.—The Wickwire Steel Co., of Tonawanda and Cortland, N. Y., has taken the preliminary step towards increasing its operations near Buffalo by the erection, at a time to be announced later, of a steel plant and mills for the manufacture of billets, rods and wire, and also to enter into part ownership in a by-product coke plant, to be built on property adjoining the present Wickwire furnaces and the proposed steel plant.

In this connection, a $2,500,000 first mortgage, 6 per cent, 20-year gold bonds has been filed with the county clerk of Erie county, against the company's plant and property on the Niagara river and also as a lien against 3,400 shares of the Wickwire Mining Co., operating ore properties of the company in Michigan.

This mortgage has been placed with the Bankers' Trust Co., of New York, and sets forth that the bonds issued in denominations of $1,000 and $500 dated Nov. 1, 1914, and maturing Nov. 1, 1934, are to be used in connection with meeting maturing obligations of the company, for the purpose of erecting the proposed steel plant and participation in the erection of the proposed by-product coke plant. The papers filed show that $1,500,000 of the mortgage is being underwritten at this time; the remainder to be issued later.

Officers of the company say that no statement is to be issued at the present time regarding the proposed new steel plant or the building of the coke plant in which the Wickwire interests are to be part owner. It is undecided just when extension operations will begin and details as to plans, covering the number of open-hearth furnaces, size of the blooming mill and the sizes and kinds of finishing mills, are yet to be determined.

It is understood that the Solvay Process Co., of Syracuse, is working in conjunction with the Wickwire interests in the matter of erecting the proposed by-product coking plant. The Wickwire Steel Co. and the Solvay interests have had this matter under consideration for several years.

The Lackawanna railroad, which serves the parent Solvay plant at Syracuse, has, it is understood, trackage rights over an industrial spur of the New York Central, extending north of Buffalo and tapping at several points the Niagara river frontage on which the proposed new steel mill and the coking plant are to be erected when market and financial conditions warrant going ahead with the work.

The two developments, it is stated, will represent the largest industrial undertakings along the Niagara frontier since the Lackawanna Steel Co. built its large plant to the south of

New Institute Members

As result of the recent letter ballots and of action taken by the board of directors in connection with the recent general meeting at Birmingham, 29 new names have been added to the membership list of the American Iron and Steel Institute. Of these 15 are active and 14 are associate. The list is as follows:

ACTIVE MEMBERS.

Frank E. Bachman, MacIntyre Iron Co., Port Henry, N. Y.

Frank G. Cutler, chief steam engineer, Tennessee Coal, Iron & Railroad Co., Ensley, Ala.

M. M. Duncan, director, Cleveland-Cliffs Iron Co., Ishpeming, Mich.

Richard H. Lee, superintendent blast furnace, Pennsylvania Steel Co., Lebanon, Pa.

Malcolm R. Maclean, manager of sales, miscellaneous department, American Steel Foundries, Pittsburgh, Pa.

George W. Vreeland, superintendent blast furnaces, Mingo and Bellaire works, Carnegia Steel Co., Mingo Junction, O.

John Joseph Eagan, president, American Cast Iron Pipe Co., Birmingham, Ala.

Frank L. Estep, chief engineer, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

David Lloyd Eynon, roll designer Homestead plant, Carnegie Steel Co., Munhall, Pa.

Charles F. Kaufholz, general manager, Perry Iron Co., Erie, Pa.

William Warren Shilling, president, Sharon Foundry Co., Sharon, Pa.

J. Warner Shook, consulting engineer, Birmingham, Ala.

James W. Whatley, manager sales coal and coke, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Frederick B. Winslow, auditor, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.

Herbert Wright, contracting manager, American Bridge Co., Atlanta, Ga.

ASSOCIATE MEMBERS.

Charles L. Bauer, president, Bauer Brothers Co., Springfield, O.

Frank E. Nulsen, president, Missouri Malleable Iron Co., East St. Louis, Ill.

Sanford B. Belden, vice president, the Jeffrey Mfg. Co., Columbus, O.

Charles M. Blanchard, district manager, the Jeffrey Mfg. Co., Birmingham, Ala.

Robert H. Jeffrey, vice president and general manager, the Jeffrey Mfg. Co., Columbus, O.

Z. B. Leonard, metallurgical engineer, Perfection Spring Co., Cleveland, O.

John L. V. Bonney, president, the Bonney-Floyd Co., Columbus, O.

Archer H. Carpenter, Carpenter & Hillman, Birmingham, Ala.

John G. Kent, general manager, American Cast Iron Pipe Co., Birmingham, Ala.

James R. McWane, vice president, American Cast Iron Pipe Co., Birmingham, Ala.

Paschal G. Shook, president, Shook & Fletcher Supply Co., Birmingham, Ala.

Hamilton Stewart, secretary, Harbison-Walker Refractories Co., Pittsburgh, Pa.

Priestley Toulmin, coal operator, Birmingham, Ala.

Herbert Tutwiler, southern sales agent, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

Very Little Legislation

Outside of Appropriation Bills Will Probably be Attempted This Winter—President Wilson's Attitude

Washington, Nov. 10. — Evidences accumulate to indicate that the Wilson administration proposes to enact as little legislation as possible at the short session of Congress, beginning Dec. 7. Moreover, this rule apparently will apply with regard to the 64th Congress.

President Wilson today told callers that no specific program for the short session has been mapped out, but pointed to the fact that it will last only till March 4 and that a great deal of legislation could not be enacted, even if it were desired. Appropriation and conservation measures, including the land leasing and dam bills, perhaps will consume all of the attention of Congress during the short session. The ship purchase bill, providing for the establishment of a government owned merchant marine, was said to be still on the calendar, but there does not seem to be the remotest possibility of its being taken up at the short session. In fact, there is a belief even among Democrats that the bill will ultimately be abandoned altogether.

It is evident, if it is ever enacted, it will be after a decidedly heated contest, for, with the strong Republican representation in the House which will be seated at the Sixty-fourth Congress, the administration is going to have a real fight in putting through measures opposed by the Republicans as well as some Democrats. Defections from the ranks of the latter can be few, and, when combining with full Republican support, fatal to any bill.

With it seemingly certain that as little attention as possible is going to be given by the administration to the legislative program, at the same time it appears that as much attention as possible will be given to the administrative branch. It will be the plan to see that measures already passed are put into full effect with an effort to make them prove successful.

The President, refusing to express himself on the election of last week, intimated that acts and not comments are to speak for themselves the next two years. He took occasion to say, however, that the Democrats are still in control of the government and outwardly at least seemed to be well satisfied with the outcome of the election.

Would Quash Bills.—Attorney W. S. Dalzell, counsel for five former employes of the Carbon Steel Co., Pittsburgh, indicted by the federal grand jury for alleged irregularity in the manufacture of steel for Panama canal work, has asked the United States district court for western Pennsylvania to quash bills against Samuel Wetmore, Henry Lutz and James E. Lacy, three of the men mentioned in the indictments. It was argued that indictments were obtained irregularly. The case is listed for trial Nov. 23.

Higher Tariff

Will Be Considered in Canada—Talk About Dumping

Toronto, Nov. 10.—J. H. Plummer, president of the Dominion Steel Corporation, stated in a recent interview that one of the unfavorable aspects of the steel situation was that American steel manufacturers were endeavoring to use Canada as a dumping ground for their products on account of unsatisfactory conditions in their home market. Canadian companies had consequently to meet very low prices in order to compete successfully, the tariff being inadequate to protect Canadian industry. It appears altogether likely that the tariff question will come prominently forward at the next session of the Canadian parliament, and the prevailing industrial depression will give the movement for increased protection better chances of success than in previous years.

The Canadian government has placed some large equipment orders for the government railways. The Eastern Car Co., of New Glasgow, N. S., has obtained a contract for 250 50-ton all-steel freight cars and the Nova Scotia Car Works, of Halifax, will supply 200 all-steel flat cars. The Preston Car Co. has a contract for sleeping cars.

The silver-lead industry of the Kootenay district, B. C., will be materially benefited by recent large orders for war material, arrangements having been made with the smelting companies at Trail, B. C., to furnish lead for shrapnel bullets.

The Toronto board of control calls for tenders up to Nov. 24 for the supplying and laying of a 72-inch steel conduit from the mechanical filtration plant to the 72-inch and 84-inch steel conduits on Toronto Island. Specifications, etc., may be obtained from James Milne, department of works, city hall, Toronto.

The chairman, Toronto Electric Commissioners, asks for tenders up to Nov. 24 for synchronous converters with their transformers and switchboard panels.

Lowest Point

In Many Months is Order Book of Steel Corporation

A further loss of 326,570 tons in its order book was the net result of the operations of the United States Steel Corporation during the month of October, as shown by the monthly statement, issued at New York on Tuesday. This makes the total loss during the past two months 752,234 tons. The orders on hand Oct. 31 were reported as 3,461,097, compared with 3,787,667 tons on Sept. 30. The order book of the Steel Corporation now is at the lowest point since May 31, 1911.

A statement of the unfilled tonnage of the Steel Corporation, showing the changes in tonnage and percentage by months, since the plan of announcing monthly the business on hand was adopted, follows:

Date.	Total.	Change, tonnage.	Change, per cent.
Oct. 31, 1914....	3,461,097	326,570—	8.62—
Sep. 30, 1914....	3,787,667	425,664—	10.01—
Aug. 31, 1914....	4,213,331	54,742+	1.32+
July 31, 1914....	4,158,589	125,732	3.12+
June 30, 1914....	4,032,857	34,697+	0.86+
May 31, 1914....	3,998,160	278,908—	6.98—
Apr. 30, 1914....	4,277,068	376,757—	8.09—
Mar. 31, 1914....	4,653,825	372,615—	7.42—
Feb. 28, 1914....	5,026,440	412,760+	8.95+
Jan. 31, 1914....	4,613,680	331,572+	7.74+
Dec. 31, 1913....	4,282,108	114,239—	2.59—
Nov. 30, 1913....	4,396,347	117,420—	2.60—
Oct. 31, 1913....	4,513,767	490,018—	9.79—
Sep. 30, 1913....	5,003,785	219,683—	4.24—
Aug. 31, 1913....	5,223,468	175,888—	3.03—
July 31, 1913....	5,399,356	407,965—	7.03—
June 30, 1913....	5,807,317	517,005—	8.18—
May 31, 1913....	6,324,322	654,440—	9.38—
Apr. 30, 1913....	6,978,762	490,194—	6.55—
Mar. 31, 1913....	7,468,956	187,758—	2.45—
Feb. 28, 1913....	7,656,714	170,654—	2.18—
Jan. 31, 1913....	7,827,368	104,796—	1.32—
Dec. 31, 1912....	7,932,164	79,281+	1.01+
Nov. 30, 1912....	7,852,883	258,502+	3.40+
Oct. 31, 1912....	7,594,381	1,042,874+	15.33+
Sep. 30, 1912....	6,551,507	388,132+	6.29+
Aug. 31, 1912....	6,163,375	206,296+	3.46+
July 31, 1912....	5,957,079	149,773+	2.58+
June 30, 1912....	5,807,346	56,363+	0.98+
May 31, 1912....	5,750,983	86,983+	1.52+
Apr. 30, 1912....	5,664,885	360,044+	6.97+
Mar. 31, 1912....	5,304,841	149,359—	2.79—
Feb. 29, 1912....	5,454,200	74,479+	1.38+
Jan. 31, 1912....	5,379,721	294,960+	5.71+
Dec. 31, 1911....	5,084,761	942,806+	23.24+
Nov. 30, 1911....	4,141,955	447,627+	12.06+
Oct. 31, 1911....	3,694,328	83,011+	2.25+
Sep. 30, 1911....	3,611,317	84,668—	2.34—
Aug. 31, 1911....	3,695,985	111,900+	3.33+
July 31, 1911....	3,584,085	223,027+	7.16+
June 30, 1911....	3,361,058	247,871+	7.96+
May 31, 1911....	3,113,187	105,617—	3.28—
Apr. 30, 1911....	3,218,704	228,597—	6.63—
Mar. 31, 1911....	3,447,301	46,758+	1.37+
Feb. 28, 1911....	3,400,543	289,624+	9.31+
Jan. 31, 1911....	3,110,919	436,163+	16.30+
Dec. 31, 1910....	2,674,757	85,656—	3.09—
Nov. 30, 1910....	2,760,413	111,536—	3.88—
Oct. 31, 1910....	2,871,949	286,157—	9.12—
Sep. 30, 1910....	3,159,106	379,088—	10.74—
Aug. 31, 1910....	3,537,128	433,803—	10.92—
July 31, 1910....	3,910,931	286,863—	6.72—

The Manchester plant of the Wheeling Mold & Foundry Co., Wheeling, W. Va., has been closed for an indefinite period because of inactivity. The Peninsula plant of the company is operating in part.

MEN OF THE IRON TRADE

Who they are Where they are What they are doing

Edwin H. Haslam, engineer for Mackintosh, Hemphill & Co., Pittsburgh, designers and builders of rolling mill equipment, is in Europe.

John A. Schroeder has resigned as general sales manager of the Hyatt Roller Bearing Co., 1120 Michigan avenue, Chicago. Mr. Schroeder's resignation will take effect immediately.

O. G. Dale, New York sales manager for the Mead-Morrison Mfg. Co., Boston, has been confined to his home by illness for the past six weeks. He is expected to return to his office in the Singer building shortly.

H. C. Hequembourg, who has been general purchasing agent, with headquarters at New York, of the American Locomotive Co. since its organization, has resigned to accept the vice presidency of the Standard Chemical Co. of Pittsburgh.

J. Rogers Flannery, president of the Flannery Bolt Co., Pittsburgh, and head of the foreign trades commission of that city, sailed for England last week in an effort to secure trade for manufacturers in the Pittsburgh district.

Charles Fair, of the General Electric Co., Schenectady, N. Y., read a paper on "Control of Motor-Driven Machine Tools", before members of the western Pennsylvania section of the National Association of Iron and Steel Mill Electrical Engineers, at the Seventh Avenue hotel, Pittsburgh, Nov. 7.

Rear Admiral Joseph Strauss, retired, of the United States navy, accompanied by Lieutenant Commander Claude C. Bloch and Lieut. Earl Cook, of the ordnance bureau of the navy at Washington, inspected plants of the Carnegie Steel Co., at Homestead and the plant of the Carbon Steel Co. at Pittsburgh, last week.

Louis R. Steurer has been appointed assistant to J. L. Replogle, vice president and general manager of sales for the Cambria Steel Co., Johnstown, Pa., who now is located at Philadelphia. Harry G. Uphouse, formerly assistant to Mr. Replogle at Johnstown, has been appointed sales agent in charge of the Johnstown district.

J. A. L. Waddell and John Lyle Harrington announce the dissolution of the firm of Waddell & Harrington, Kansas City, Mo. The firm's business will be conducted as usual till the conclusion of its affairs in July, 1915, except that it is accepting no new commissions. Dr. Waddell will give his attention to special engineering and financial matters and to important advisory work. Mr. Harrington will be joined by the firm's associate engineers, E. E. Howard and Louis R. Ash, in the establishment of the firm of Harrington, Howard & Ash, consulting engineers.

Arthur E. Woolsey, who for the last three years has been in India, engaged in starting the Tata Iron & Steel Co. plant at Sakehi, is returning home and is expected to arrive in New York about the middle of November. Mr. Woolsey reports that the Tata works now are on a firm footing, that the company has made money from the outset, and the profits are increasing yearly.

C. E. Stone will talk on "The Distribution System of a Large Central Station", Nov. 10, before the Pittsburgh section of the American Institute of Electrical Engineers. The meeting will be held in the society rooms of the Engineers' Society of Western Pennsylvania, Oliver building. Mr. Stone's talk will be illustrated by numerous lantern slides and a moving picture film showing the process of laying the heavy 11,000-volt submarine cable under the Ohio river from the Brunot's island power plant to the south shore. The annual banquet of the Pittsburgh section will be held Dec. 12 at the Fort Pitt hotel.

Captain Thomas Walters, of Ishpeming, who will retire to private life on Jan. 1, is one of the most prominent and successful of the mining men who have helped make the Lake Superior region the world's greatest source of iron ore supply. For many years, Captain Walters has been general manager of the Jones & Laughlin Steel Co.'s mining interests, and all of that corporation's mines, with one exception—that of the Lake Angeline—have been opened under his supervision. He has resigned and will, it is understood, be succeeded by Eugene F. Bradt, formerly chief engineer of the Marquette range properties. Captain Walters has been a miner since his boyhood days in England. He advanced step by step in the Jones & Laughlin service and, more than 30 years ago, was appointed to his present position. The properties under his charge have been great training centers for mining captains and executives, and many men who had their first tutelage under him have been notably successful in their vocation. He was one of the first of the Lake Superior superintendents to adopt the caving system of mining soft ore. Captain Walters retires with the distinction of having established the Lake Angeline as probably the safest mine in the region. The number of men employed and the extended period of operation considered, the accidents have been remarkably few. The Jones & Laughlin company has greatly expanded its Lake Superior interests during the last score of years, particularly on the Mesabi, under Captain Walters' supervision, and it is possessed of several fine mines and large reserves of ore.

John Lyle Harrington, E. E. Howard and Louis R. Ash have established the firm of Harrington, Howard & Ash, and will conduct a general consulting practice similar to their work, including hydro-electric developments, advisory municipal engineering, appraisals, examinations, and reports upon engineering projects, giving special attention to foundations, bridges — particularly movable spans—and other structures in steel and reinforced concrete. Mr. Harrington spent many years in bridge and structural shops, two of which he designed and operated, in the service of railroad companies, and in mechanical and electrical work. For three years he was the executive engineer of the C. W. Hunt Co., New York, and for two years he was chief engineer and manager of the Locomotive & Machine Co., Montreal, the American Locomotive Co.'s Canadian subsidiary. For the past eight years he has been a member of the recently dissolved firm of Waddell & Harrington, consulting engineers, Kansas City, Missouri, and in that capacity has developed the vertical lift bridge and directed the design and construction of many millions of dollars' worth of important bridge work. Mr. Howard has been associated with Dr. J. A. L. Waddell for 14 years, for many years principal assistant engineer and later associate engineer of the firm of Waddell & Harrington. Mr. Ash has had many years' experience in engineering work, and from July, 1910, to April, 1913, was city engineer of Kansas City. The principal office of the new firm will be in the Orear-Leslie Bldg., 1012 Baltimore avenue, Kansas City, Missouri.

Structural Tonnage Light

Some Improvement in Sentiment, But Few Contracts Are Being Made for New Buildings

Pittsburgh, Nov. 10.—While there is some improvement in sentiment among fabricators and erectors in the Greater Pittsburgh district, there has been no tangible evidence of any betterment. Structural shapes are fairly firm at 1.10c, but plates, it is reported, have sold at less than 1.10c, Pittsburgh, in other sections. Reinforcing bars are commanding about $1 a ton above steel bars, named at 1.10c. Contract for the new Schenley high school, which will involve about 1,300 tons, was awarded the J. L. Stuart Co., this city, for $741,100. Eight other contractors, whose bids ran from $681,226 to $733,325, offered to do the work for less than the Stuart company. The Stuart company agreed to complete work before Oct. 1, 1015.

More New England Inquiry

New York, Nov. 10.—Inquiry for structural steel from some eastern districts, notably New England, is showing betterment, both in number and total tonnage. These requirements, however, usually run to small amounts, individually. In the metropolitan district, the situation is unchanged and work still is coming out and being closed slowly. A few more orders for bridges have been distributed by the railroads. None of them have been of large tonnages, however. The award of the substructure contract for the large Chesapeake & Ohio Northern railroad bridge at Scioto-ville, O., indicates that this work is going ahead, though there is no indication when the approximately 15,000 tons of steel work will be placed. Fabricators usually report slack shop conditions, but the American Bridge Co., in its eastern division, has been maintaining an output of about 85 per cent. Its shipments last month were 18,000 tons. The bookings of the eastern division up to Oct. 1 were only slightly below last year. Subway and elevated railroad work figured considerably is helping out this fabricator. Fabricated prices are very low, some recent bids on apartments being around $45, erected. Plain material continues at 1.26c to 1.31c, New York, or 1.10c to 1.15c, Pittsburgh.

Eastern Mills Seek Orders

Philadelphia, Nov. 9.—Even the small orders for shapes now are being closely competed for in this territory and this fact is reflected in prices. On carload orders, less than 1.30c, Philadelphia, or 1.15c, Pittsburgh, is appearing. For the larger orders 1.25c, Philadelphia, or 1.10c, Pittsburgh, is easy. The market is severely dull and comparisons of present conditions with the depression days of the early nineties continue to be made by sellers. The situation for the mills in eastern Pennsylvania is increasingly serious, as the old bookings which have been the backlog of recent operations are falling to a low stage and fresh business falls much short of balancing off even the reduced operations.

Shapes Show Weakness

Chicago, Nov. 10.—Structural shapes have become the weakest of the finished steel products in this territory in point of tonnage and while prices remain nominally 1.25c to 1.34c, Chicago, an attractive tonnage seems likely to bring out a better figure. Contracts awarded during the past week were few and of extremely small tonnage, this department being in the quietest situation that has existed for many years.

CONTRACTS AWARDED.

Thompson Falls Power, racks, rack frames, guides, etc., Thompson Falls, Mont., 289 tons.

City of Ely, Minn., 300,000-gallon water tank, Ely, Minn., 183 tons, to Des Moines Bridge & Iron Co.

Fifth Regiment Infantry, Illinois National Guard, Armory building, Quincy, Ill., 137 tons to general contract to Menke Stone & Lime Co., Quincy, Ill.

Paducah & Illinois R. R. Co., 70-foot through plate girder span, near Putrell, Ky., 100 tons to American Bridge Co.

Western Reserve Bank building, Warren, O., 400 tons, general contract to George A. Fuller Co.

Erie Railroad Co., bridge material, 250 tons, awarded to Lackawanna Bridge Co., Buffalo.

For export to Cuba, 250 tons structural, awarded to Lackawanna Bridge Co., Buffalo.

Bascule bridge, New York state Erie-barge canal, Syracuse, 200 tons, awarded to Lupfer & Remick, contracting engineers, Buffalo.

Contract G, Erie-barge canal, Seneca Falls-Waterloo division, 150 to 200 tons machinery, 200 to 250 tons structural, 175 tons cast iron work, awarded to Lupfer & Remick, Buffalo.

Contract M, Erie-barge canal, Seneca Falls-Waterloo division, 200 tons machinery, 125 tons cast iron, awarded to Lupfer & Remick, Buffalo. Both contracts G and M are for canal gates, valves and operating mechanism. Ready for bids on metal and machinery.

Bridge work for New York, New Haven & Hartford railroad, New London, Conn., 550 tons, awarded American Bridge Co.

Bridge work for Pennsylvania railroad at Wilkinsburg, Pa., 500 tons, awarded to the American Bridge Co.

Highway bridge at Portland, Me., 2,000 tons, awarded Phoenix Bridge Co., which previously had been reported as low bidder.

Addition to the plant of the Remington-Union Metallic Cartridge Co., Bridgeport, Conn., 500 tons, awarded to the Berlin Construction Co.

Bridge work for the Erie railroad, 800 tons, divided equally between American Bridge Co. and the McClintic-Marshall Co.

Additional work for New York barge canal, 2,700 tons, divided among independent fabricators.

Addition to Homeopathic Hospital, Boston, 200 tons, awarded New England Structural Co.

Sub-structure for bridge over the Ohio river at Sciotoville, O., for the Chesapeake & Ohio Northern railroad awarded to the Dravo Construction Co., Pittsburgh. Steel work, about 15,000 tons, yet to be placed.

Schenley high school, Pittsburgh; general contract awarded J. L. Stuart Co.; about 1,300 tons of steel will be involved.

CONTRACTS PENDING.

Brewery and stock house for the Jacob Ruper Brewering Co., East Ninety-second street, New York City, 1,800 tons, general contract held by Murphy Bros., steel work pending.

Apartment house, 407 Park avenue, New York City, for Cross & Cross, 800 tons, bids being taken.

Grade crossing work at Johnstown, Pa., for Pennsylvania railroad, 300 tons, bids being taken.

Hoop Steel

Inquired for by London Firm—Interested in Other Products

Percy G. Donald, director, Rowinson, Drew & Clydesdale, Ltd., 225 Upper Thames street, London, E. C., under date of Oct. 23 advises THE IRON TRADE REVIEW that his firm is in the market for hoop steel, for packing case makers. The London company buys hoops in 112-pound rolls, in large quantities, and had been obtaining requirements from Germany until the outbreak of the war.

Quotations are asked on hoops ⅝-inch, ¾-inch and ⅞-inch wide, including 24, 26, 28 and 30 gage. A standard extra is paid for hoops punched at intervals of 4 inches. The company is prepared to place immediate business, Mr. Donald advises, on 112-pound rolls, at a price per roll, F. A. S. New York, on the basis of ⅞ inch wide. Extras are offered for other gages, punching, etc.

Mr. Donald also is interested in weekly base prices on galvanized corrugated sheets, coopers' hoops, mild steel plates and sheets, planished or Russian sheets, cut nails, cut tacks and wire, including bright, galvanized, tinned, coppered and barbed.

Mr. Donald, who visited manufacturers in this country several weeks ago, has sent the Pittsburgh office of THE IRON TRADE REVIEW, 2149 Oliver building, samples of hoops and felt for roofing purposes. Manufacturers interested in these lines may see samples at the above office.

Rownson, Drew & Clydesdale, Ltd., have been figuring prominently in the American market as buyers of wire nails and barbed wire.

Common Carrier

Is Birmingham Southern, According to Commerce Commission

Washington, Nov. 10.—The Birmingham Southern railroad, owned by the Tennessee Coal, Iron & Railroad Co., and serving the Birmingham-Bessemer, Ala., iron and steel district, is a common carrier and as such entitled to make joint rates with other carriers and to receive divisions out of such rates.

This finding was handed down yesterday in a decision by the Interstate Commerce Commission, with Chairman James S. Harlan dissenting. As in the supplemental report to the Industrial Railways case, the Birmingham Southern decision was based chiefly upon the decision of the Supreme court in the tap line cases.

Prescribed by the commission is a maximum division of 6.5c a ton on carload traffic covered by suspended joint tariffs to be paid by the Atlanta, Birmingham & Atlantic to the Birmingham Southern, this division being found not to be in the nature of a rebate. No specific finding is made with respect to the amount of the division allowable to the Birmingham Southern on less-than-carload traffic, but the carriers are expected to make such readjustments as the change from the larger allowance under the suspended tariffs to the 6.5c a ton basis on carload traffic may suggest. The new rates are to become effective within 60 days from the date of the service of the report. The decision also allows the payment of $2 per car to the Birmingham Southern as a switching charge on freight originating at Birmingham proper and Bessemer.

Death of Henry Melcher

New York, Nov. 11. (By wire.)—Henry J. G. Melcher, general manager of the Rainey Coal & Coke Co., dropped dead in the Day and Night Bank, in Fifth avenue, Manhattan, yesterday afternoon. Mr. Melcher was about 55 years old. He had been connected with the Rainey company for 30 years, and had been manager of the corporation for the past 15 years. He was born in Cleveland, but moved to New York when the Rainey company transferred its offices about 10 years ago. Mr. Melcher was prominent in coal and coke circles, and was regarded as a man of great ability. He leaves a wife, two daughters and a son.

Unsettled

Conditions in Ferro Owing to the British Embargo

New York, Nov. 11. (By wire.)—The ferro market continues up in the air today. No sales or quotations are being made, as sellers are holding to such unengaged lots as they may have pending further clearing of the situation. Traders are making an effort to pick up any re-sale tonnage available, as the general expectation is that prices will sharply advance, should consumers put forth any demand, which they are not at present, as they are covered for a few months at least except in individual cases. It is apparent that the whole situation hangs on the question of how long the embargo will be continued. Prices are wholly nominal.

Radical Labor Legislation Defeated

Seattle, Nov. 10.—*The election last Tuesday resulted in the overwhelming defeat of radical propositions demanded by union labor in the Pacific Coast states. The latest returns indicate that the proposed universal eight-hour law for the state of Washington has received* 99,000 *votes, while* 170,000 *were cast against it. For the first aid to the injured law,* 140,000 *votes were cast, while* 120,000 *were recorded in the negative. In California, the eight-hour law has been defeated by a vote of* 100,000 *for and* 190,000 *in opposition. In Oregon likewise, the universal eight-hour law has been defeated, only* 30,000 *votes being recorded in favor of it, while* 84,000 *voters recorded their ballot against it.*

Destroyers

Will Not Be Awarded Until Bids Are Compared

Washington, Nov. 11. (By wire.)—Contracts for the six destroyers for which bids were opened yesterday will not be let until the bids have been compared in detail with estimates submitted by the Mare Island navy yard. In line with the practice inaugurated by Secretary Daniels, competing bids with private builders are received from navy yards. The Mare Island estimates ranged from $626,670 to $674,917 on the destroyers. These estimates make no allowance for interest on plant deterioration, overhead charge or superintendence and therefore it is difficult to reach a proper basis of comparison with private yards.

The Fore River Ship Building Corporation, Quincy, Mass., submitted the lowest figure on two of the six torpedo boat destroyers to be built for the navy. This bid, under modifications of Class 2, providing that the hull and equipment and specifications are to be in accordance with those of the department, while the machinery was $795,000 for each vessel. On three vessels, under Class 1, to be constructed in accordance with plans and specifications of the department, including hull and turbine propelling machinery, the William Cramp & Sons Ship & Engine Co., Philadelphia, was the lowest at $834,000 each.

The greatest number of vessels on which any single bidder, out of the six companies, submitted figures was three. Distinction was made by some in Class 2, modifications being provided and figures therefore differing accordingly. Time for completion of the vessels varied from 21 to 24 months, while the speeds provided were 29½ and 30 knots per hour.

METAL MARKETS

New York

Nov. 10.

The most important event of the week in the non-ferrous metal market was the resumption, yesterday, of trading on the London and New York metal exchanges. As yet, the activities on the New York exchange are confined to tin, lead and spelter. It is not known when trading in standard copper will be resumed. In tin, there are four "calls" daily, one on spot lots of five tons, one on spot lots of 25 tons, one on shipments from European ports in lots of 25 tons each, and one on shipments from far eastern ports in lots of 25 tons each.

Tin continues the firmest of the metals, by reason of the great scarcity in spot, and the comparatively small amount afloat to this country. Spot today is held at about 34.50c, but there are very few sellers. Conditions are such that were it not for the small interest shown by consumers, prices probably would be advancing as rapidly as they did in the days immediately following the out-break of the war. Higher prices are expected, since there are numerous ways in which fresh developments in the war situation might serve to interrupt tin shipments temporarily, or cut us off entirely from the far east. Arrivals since the first of the month have been only 560 tons, while of the 1,760 tons now afloat, only 525 tons are regarded as being certain to arrive here by Nov. 20.

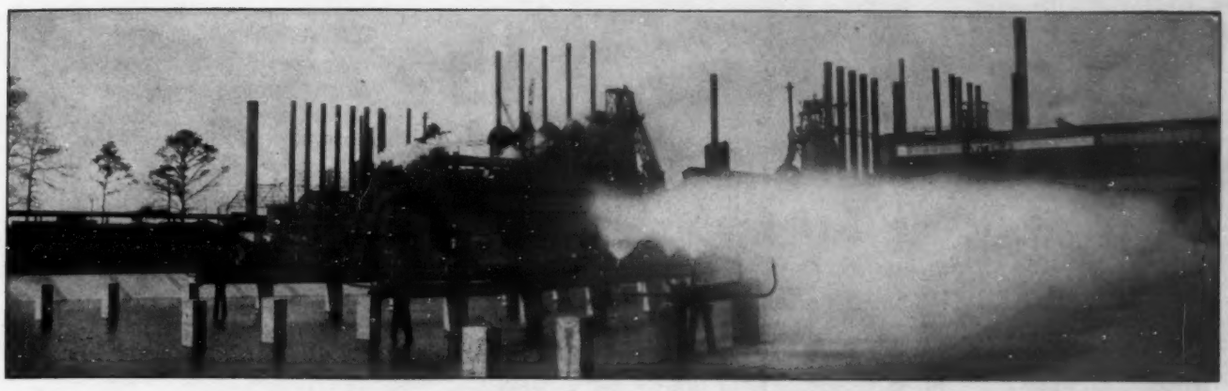


Fig. 1—Spray Pond with Woodward Furnaces in the Background

Woodward Plant Improvements

Description of New Blast Furnace, Blowing Engines, Coal Washing Plant and Other Extensions to Facilities of Woodward Iron Co.

FOR over a third of a century the Woodward Iron Co. has been prominent among the pig iron producers of the south. The company was organized in the fall of 1881, with W. H. Woodward as president, and J. H. Woodward as secretary and treasurer. J. N. Vance, president of the Riverside Iron Works, Wheeling, W. Va., was associated with the Woodward brothers on the board of directors. The first furnace was built at Woodward, Ala., about 12 miles southwest of Birmingham, in 1882 and 1883. The first cast was made in August, 1883. This furnace, which was rated at 100 tons per day, was 17 feet in diameter at the bosh and 75 feet high. A second furnace was erected at Woodward in 1886 and a third was lighted in June, 1905. In common with other Alabama furnaces, the coal, iron ore and limestone properties all lie within a radius of a few miles, the Woodward company's coal mines being about two miles northwest and the ore mines about three miles to the southeast of the plant. This unsurpassed geographical position is one of the chief assets of the Woodward company, and contributes in a large measure to its ability to make pig iron at remarkably low cost. The Woodward company specializes on the manufacture of sand cast foundry pig iron and for this purpose its plant is entirely self-contained.

Within the past three years extensive improvements have been made to the facilities at Woodward, including the construction of a by-product coke plant, a coal washer and a new blast furnace, and the erection of additional blowing equipment, new boilers, pumps, electrical machinery, and a new office building. At the same time improvements have been made to the railroad which connects the mines on either side of the valley with the furnace plant.

The first section of the by-product coking plant, consisting of 60 ovens, was described in THE IRON TRADE REVIEW, Jan. 5, 1911. The new blast furnace, blowing equipment, boilers, coal washer, etc., are of more recent date; also within the past year extensive additions have been made to the coke oven plant, materially increasing its capacity. The new blast furnace replaces the original Woodward stack, and is known by the same designation, No. 1. It was blown in early this year. By its construction the pig iron output of the plant is materially increased, since the new furnace has a capacity of from 400 to 450 tons per day. It is skip filled, 22 feet in bosh diameter and 90 feet in height. It is situated between the two older furnaces, all three stacks being served from a common stock trestle of concrete construction. The furnace was designed by the Woodward Iron Co., and the plate work on the stack and the stoves was executed by the Variety Iron &

FIG. 2—NEW WOODWARD NO. 1 FURNACE FROM STOCK TRESTLE

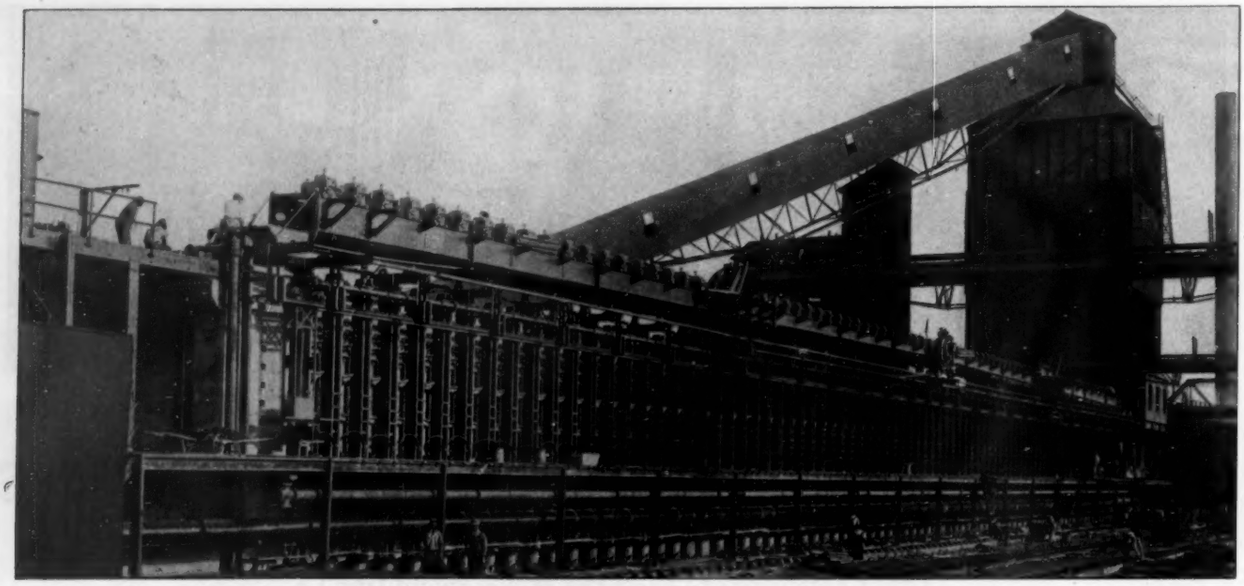


FIG. 3—NEW KOPPERS COKE OVENS AT WOODWARD

Steel Works Co., Cleveland. The general arrangement of the new furnace is shown in Fig. 2, and the lines are illustrated in Fig. 9. As indicated by the latter, the volume of the furnace is 19,544 cubic feet measuring from the center line of the tuyeres to the bottom of the bell when the latter is closed.

The shell is 30 feet in diameter at the mantle which is 22 feet 6½ inches above the center line of the iron notch. The latter is 2 feet 3 inches above the hearth level, the hearth itself being 10½ feet in minimum diameter. The normal diameter of the furnace inside of lining at the tuyere level is 15 feet. As stated above, the bosh diameter is 22 feet and the throat diameter is 15 feet. The shell is 22 feet 10 inches in diameter at the top.

The bosh walls are only 13½ inches in thickness but are backed by 44 Shannon cooling plates 3½ inches thick and 14 feet long. The plates are 15 inches wide at the bottom and 20¾ inches at the top. They are made of cast iron in which a return bend of 1½-inch extra heavy steel pipe is embedded. This pipe carries a stream of water. The cooling plates are supported by 1¼-inch steel bosh plates. The use of exterior cooling troughs at the bosh has been entirely eliminated. The details of this feature of the furnace are shown in Fig. 12, which also indicates the arrangement of the tuyeres, bustle pipe, cinder notches, etc. It will be noted that the Shannon cooling plates extend into the brick wall about 16 inches above the mantle, thus preventing the deep scouring which frequently occurs at this point.

The blast is carried to the twelve tuyeres through a bustle pipe which is supported by brackets bolted to the columns carrying the mantle. The bustle pipe is 5 feet 1 inch outside diameter, lined to an inside diameter of 42 inches. The details of the connections between the bustle pipe and

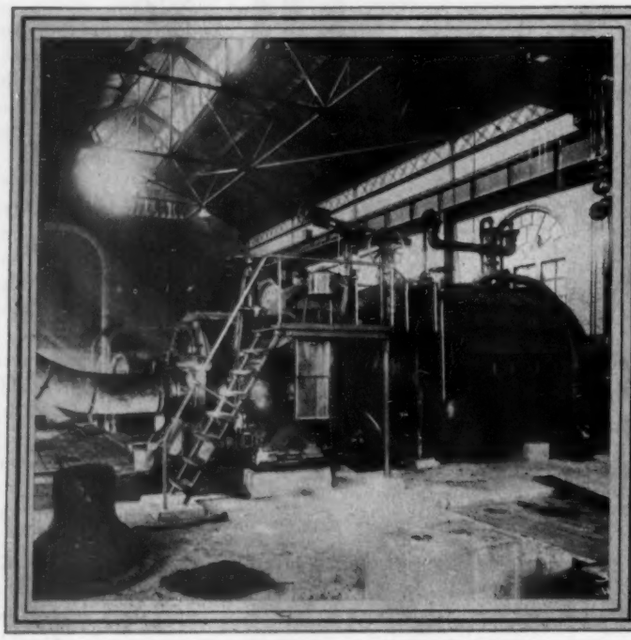


FIG. 4—GENERAL ELECTRIC TURBO-BLOWER

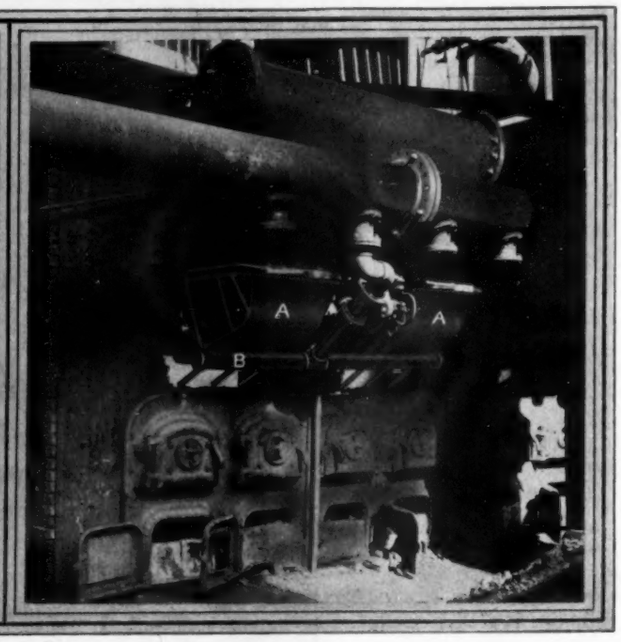


FIG. 5—THE BOILERS ARE PROVIDED WITH BURNERS FOR FURNACE AND COKE OVEN GAS

the tuyeres are clearly shown in Fig. 12, which also shows one of the two cinder notches, together with the location of the bronze cooling blocks which are used to protect the tuyere region.

The gas is led out of the top of the furnace through two downcomers which join in a single pipe leading to the dust catcher. The latter is of standard construction, 25 feet in diameter and 27 feet high. From it, the gas passes to a Mullens washer which cleans it sufficiently for use under the boilers.

In order to provide a high temperature suitable for the combustion of ample cleaning space is provided at the bottom. The stoves are arranged in a line parallel to the stock trestle and are spaced on 27-foot centers.

The arrangement of the top of the furnace is shown in Fig. 13. The upper bell is of the hopper type. It fits in a cylindrical casing, in which it both slides vertically and rotates axially. When discharging its contents onto the lower bell, it occupies the position shown by the dotted lines in Fig. 13. The upper bell is so arranged that it rotates through 96 degrees each time it is opened, thus accurately distributing the stock on the four quarters of the lower bell.

for ore, coke, and limestone underneath the trestle are concrete and are arranged to discharge into a concrete tunnel in which the electric transfer larries are operated. The skip runways terminate in this tunnel. The larries are equipped with recording scale mechanism. The general arrangement of the stock trestle is shown in Fig. 6.

This illustration shows an ore train discharging its load into the bins. The ore is brought down from the mines in trains of about fifteen 50-ton cars; longer trains cannot be handled owing to the steep grades on the railroad, with unprotected grade crossings

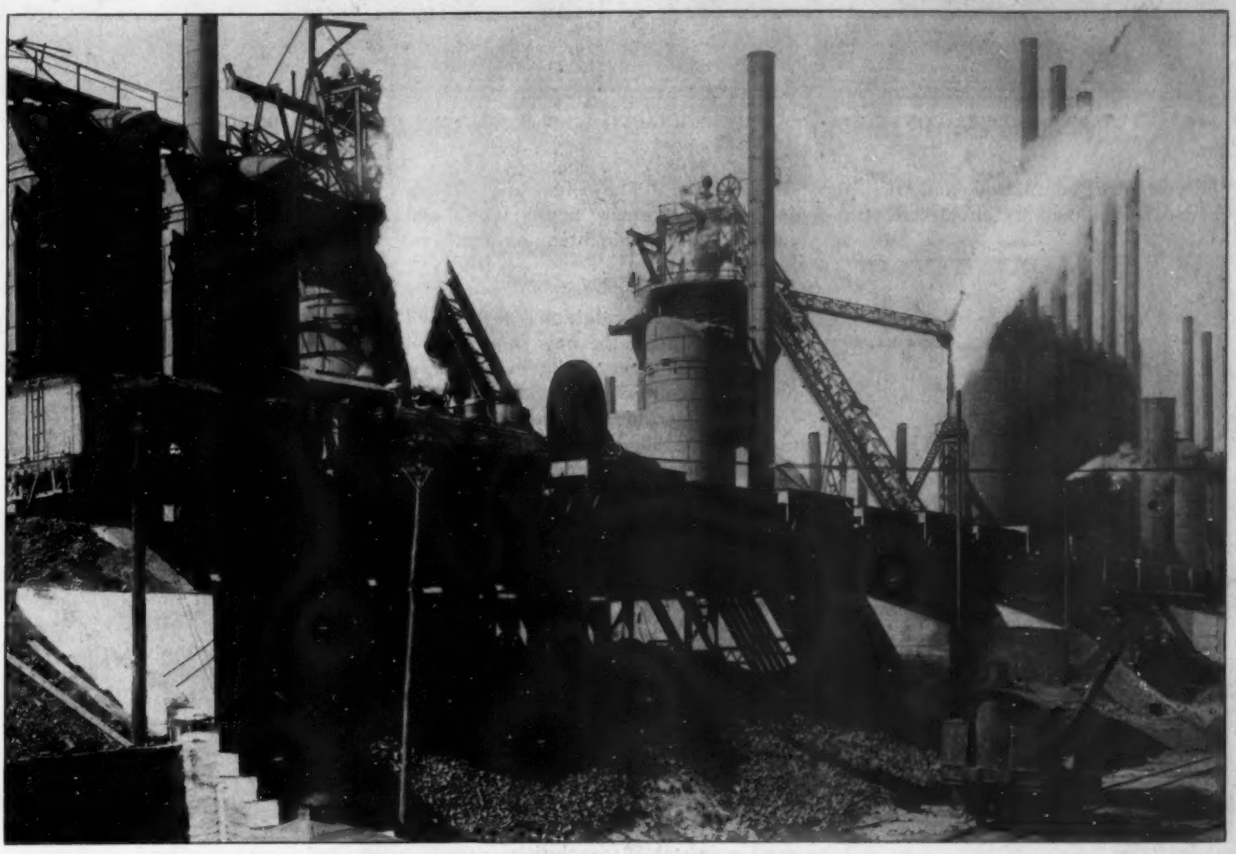


FIG. 6—ORE TRAIN UNLOADING AT FURNACE PLANT

southern by-product coke, the furnace is equipped with five Foote type, side combustion two-pass stoves, each 22 feet in diameter and 110 feet high. These stoves are provided with Berg hot blast valves and bell type gas valves. The dome of each stove has a radius of 11½ feet and a height of 8½ feet. The wall between the combustion chamber and the checker chamber is laid with first quality brick and is 2 feet 3 inches in minimum thickness. The combustion chamber has a maximum width of 4 feet 1 inch, and the outside wall is laid with 9 inches of first quality brick backed by an equal thickness of third quality brick. The checkers are 6 inches square and

The latter is of standard construction as indicated in Fig. 13, which also shows the arrangement of the operating steam cylinders, bell rods, links, etc.

Cantilever Skip Bridge

The skip bridge is of the cantilever type and no weight rests on the furnace shell. The skip dumping mechanism is clearly shown in Fig. 13. The skip is controlled by a steam operated hoist furnished by the Otis Elevator Co., Chicago. It is located under the stock trestle at the bottom. The skip itself has a capacity of 115 cubic feet.

As mentioned above, all three furnaces are served from a single steel and concrete stock trestle. The bins

at the bottom. When the trains arrive at the furnaces, they are split and seven or eight cars at a time are run up on the stock trestle and unloaded. All of this work is done by the regular train crews and the unloading is accomplished very rapidly, at an average rate of a car a minute. The trains are rarely held at the furnace plant longer than half an hour and when they are unloaded, they immediately return to the mines. The ore, therefore, is handled with a minimum amount of rolling stock and at very low cost.

As stated above, the iron is cast in sand molds, the cast house for No. 1 furnace being 64 feet wide and 300 feet long. The walls are left open for

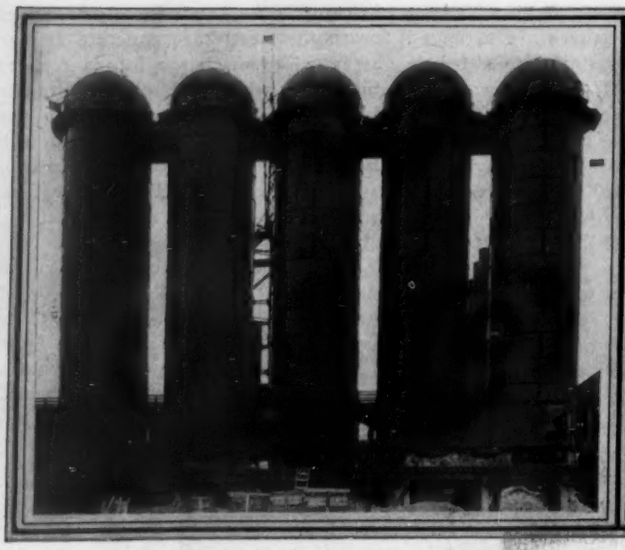


FIG. 7—TWO-PASS STOVES CONNECTED TO NEW FURNACE

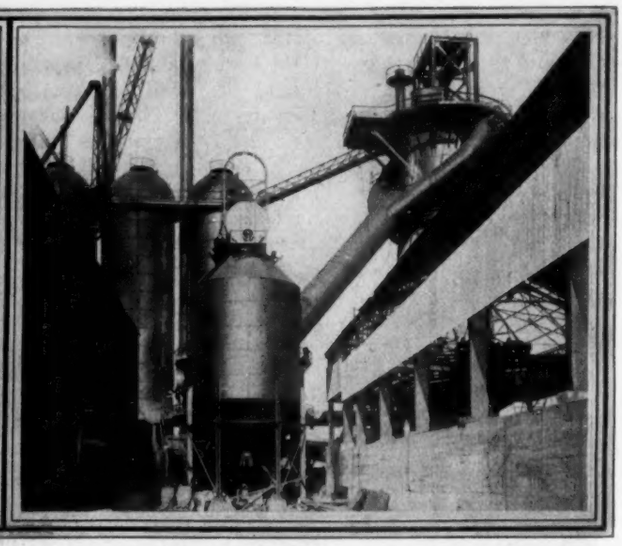


FIG. 8—DOWNCOMER AND DUST CATCHER OF NEW FURNACE

purposes of ventilation and the pig beds are spanned by an electric traveling crane. The pigs are broken up by hand, using negro labor and also by a Ladd pig breaking machine.

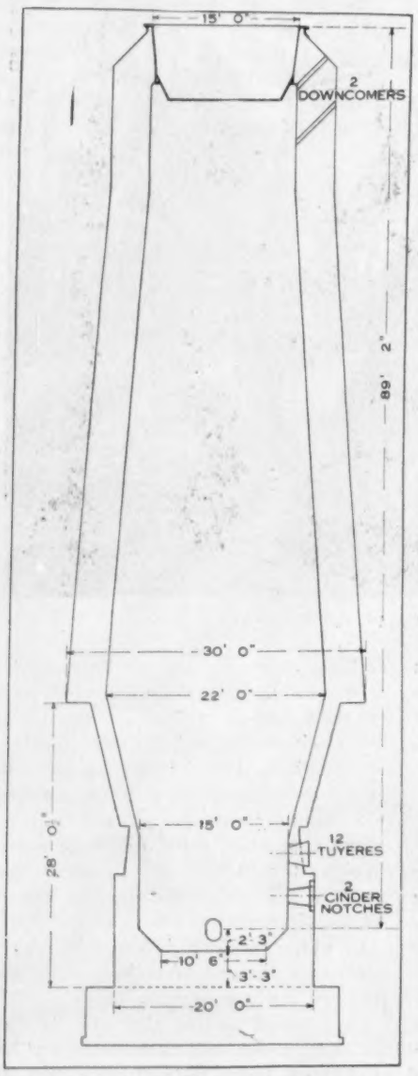


FIG. 9—LINES OF NEW NO. 1 FURNACE

New Blowing Engines

To supply the additional volume of air necessary for the new furnace, and also to take care of the higher blast pressures employed with by-product coke, considerable additions have been made to the blowing equipment. The new units include four cross compound horizontal engines furnished by the Mesta Machine Co., Pittsburgh, and a high pressure turbo-blower furnished by the General Electric Co., Schenectady, N. Y. The operation of the latest type reciprocating blowing engines side by side with a turbo-blower forms a very interesting combination. The opportunity for comparative tests under identical conditions is exceptional and the performance of these units will be watched with more than ordinary interest. The steam engines are designed to run condensing at 70 revolutions per minute; the high pressure cylinders are 48 inches and the low pressure cylinders 84 inches in diameter; the blowing tubs also are 84 inches in diameter with a common stroke of 60 inches.

The first two of the four Mesta engines were built and erected in record-breaking time. The details of this rather remarkable piece of work were presented in the Jan. 22 issue of THE IRON TRADE REVIEW, and some of the problems encountered in erecting the engines were described in the May 14 issue, page 880. The first engine was completed and loaded on board the cars at the Mesta works in Pittsburgh in 38 days and the second in 59 days from the date of signing the contract at Woodward, Ala. The first engine was completed 53 days ahead of the time specified in the contract. It was completely assembled on the erecting floor on Dec. 22, 1913, and at 6 p. m. the next day the engine was loaded on 16 cars ready for shipment. Arrangements were made with the Pennsylvania railroad to run the sixteen cars as a special train to Cincinnati, and with the Louisville & Nashville railroad to take it through as a special train from Cincinnati to Woodward. The train arrived at Woodward on the morning of Dec. 27, three days from the time it left the plant of the Mesta Machine Co. It is believed that this is not only the world's record in building engines of this size, but in delivering 900,000 pounds of machinery a distance of 834 miles.

On Tuesday, Dec. 23, word was received at the Woodward Iron Co. that the first engine was being shipped from the plant of the builder. The foundation had not been prepared as it had been expected that a much longer time would be required to complete the engine. The ground was covered with a large cinder pile, but as soon as the message was received, work was started and within six days the foundation was completed and the first casting in position.

No overhead cranes were available for erecting purposes and it was necessary to resort to unusual methods in order to assemble the engine with the desired speed. A track was laid at the sides and ends of the foundation and a 25-ton railroad crane with a 40-foot arm procured. The difficulties encountered during erection are indicated by the fact that to move the crane from one end of the foundation to the other, a distance of a few

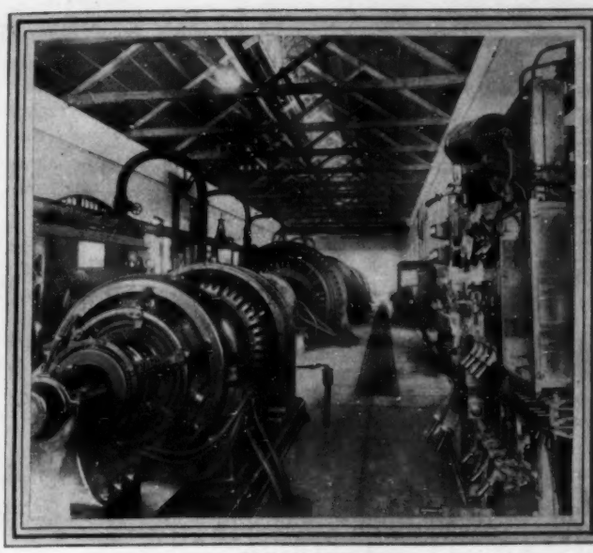


FIG. 10—ELECTRIC POWER STATION

FIG. 11—BOSH OF NEW FURNACE

feet, it was necessary to go around on the yard tracks for a distance of two miles.

The engines are of the horizontal, cross-compound type with the air cylinders placed directly behind the steam cylinders. Both the high and low pressure steam cylinders are equipped with corliss valve gears and the air end with Iversen automatic inlet and outlet valves. These valves require no gear and allow the air cylinders to be placed directly back of the steam cylinders. A large receiver is placed over the air cylinders, which practically eliminates vibration in the air line to the furnace. The engines are designed for 30 pounds air pressure.

The turbo-blower, Fig. 4, is of the well known General Electric type, rated 4,450-6,260 horsepower at 110 pounds per square inch pressure. It operates at from 3,100 to 3,500 revolutions per minute, the air pressure varying from 20 pounds per square inch normal, to 30 pounds maximum. The air delivery is 50,000 cubic feet per minute and the unit is one of the largest in the country. It operates condensing, the average vacuum being approximately 27 inches. The blower has proved satisfactory in operation and the small amount of floor space which it occupies is a factor in its favor.

In addition to the blowing equipment mentioned above, the Woodward Iron Co. operates eight older vertical units which were furnished by the Mesta Machine Co., Pittsburgh, the Allis-Chalmers Mfg. Co., Milwaukee, and the Southwark Foundry & Machine Co., Philadelphia. The exhaust steam from three of the vertical blowing units is conveyed to the electric power station where it is used in low pressure turbo-generators.

Mixture of Gases Burned

Steam for the plant is furnished by 41 vertical water tube boilers, with an average rating of 400 horsepower each. At the present time 10 new 400-horsepower vertical Wickes boilers are being installed. A mixture of blast furnace gas and coke oven gas is burned under the boilers and no coal whatever is used for making steam either for the blowing engines or the electric power station. Furnace gas is mixed with the by-product gas in the proportions of approximately 90 per cent of the former to 10 per cent of the latter. The furnace gas is introduced under the boilers through burners of the standard type and the by-product gas is injected beneath the furnace gas by small pipes which connect with a by-product gas manifold. This arrangement is clearly indicated in Fig. 5, where the furnace gas burner is indicated by *A* and the coke oven gas by *B*.

At the electric power station, electricity is generated for use throughout the furnace plant, at the coke ovens, and also at the iron ore and coal mines on the adjacent mountain sides. At the ore mines, electric hoists are utilized and electric drills are being introduced. The latter eventually will eliminate the necessity for air compressor equipment at the ore mines. The current is generated at 3,300 volts, 25 cycles, 3-phase. The generating equipment includes three 400-kilowatt Buckeye engines direct connected to Allis-Chalmers generators, together with two 1,000-kilowatt General Electric mixed pressure turbo units and a 600-kilowatt Allis-Chalmers generator direct connected to a

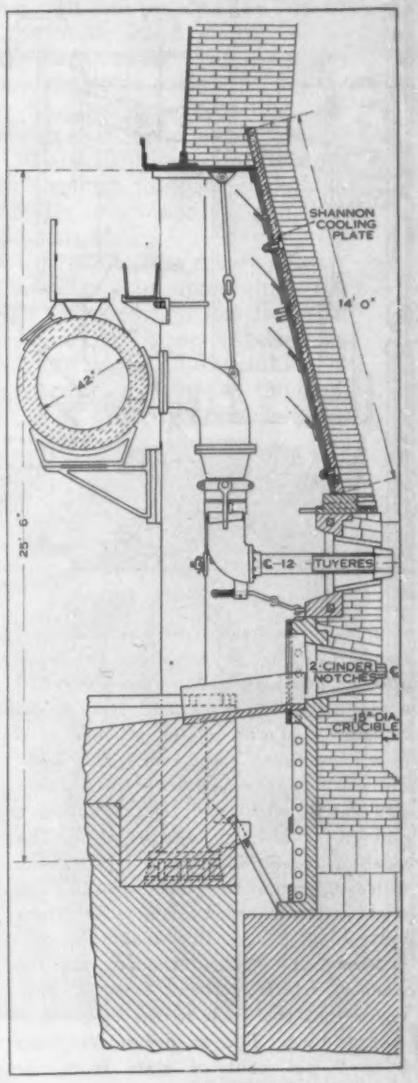


FIG. 12—DETAILS OF BOSH CONSTRUCTION

Fleming-Harrisburg engine. Two jet condensers of the Hellander type are provided, one being rated at 15,000 horsepower. An average vacuum of 27 inches is maintained. The condensate is cooled in a spray pond situated near the furnaces.

The by-product coking plant contains at present 170 Koppers regenerative ovens with facilities for the complete recovery of by-products. The ovens are charged with 13¼ tons of coal and operate on a 17-hour coking period. The general features of this plant were described in THE IRON TRADE REVIEW, Jan. 5, 1911. At present about 2,250 tons of coke are made daily.

Recently a Link Belt coal washer has been installed which materially improves the quality of the coke. It has a capacity of 150 tons per hour and is provided with three Wendell centrifugal dryers which reduce the moisture content of the washed coal to approximately 8 per cent. The washing plant is equipped with three Faust jigs rated at 50 tons per hour each and three Luhrig rewash jigs. The washing plant is located across the railroad from the coke ovens. The coal is transferred from the track bins to a Bradford breaker and a crusher and from thence to the washer, which delivers it to a conveyor that carries it to the by-product storage bins. The washer rejects from 8 to 9 per cent of slate from the raw coal.

A plant has been erected near the coke ovens by the American Tar Products Co., and a contract has been made with the Woodward Iron Co. to purchase the tar which is recovered in the coking process. The tar is pumped from the ovens to the refining plant through a heavy pipe line. The American Tar Products Co. uses the raw tar for the manufacture of creosote, coated paper, paving material, etc.

In connection with the improvements to the furnace plant, coke ovens, etc., which are described above in some detail, the ore and the coal mines have been enlarged and considerable new equipment provided. In the wooded park, adjacent to the furnace plant, a new two-story office building has been erected. The new blast furnace has been in service since March, 1914. The officers of the Woodward Iron Co. include J. H. Woodward, president; A. H. Woodward, vice president, and R. H. Banister, secretary.

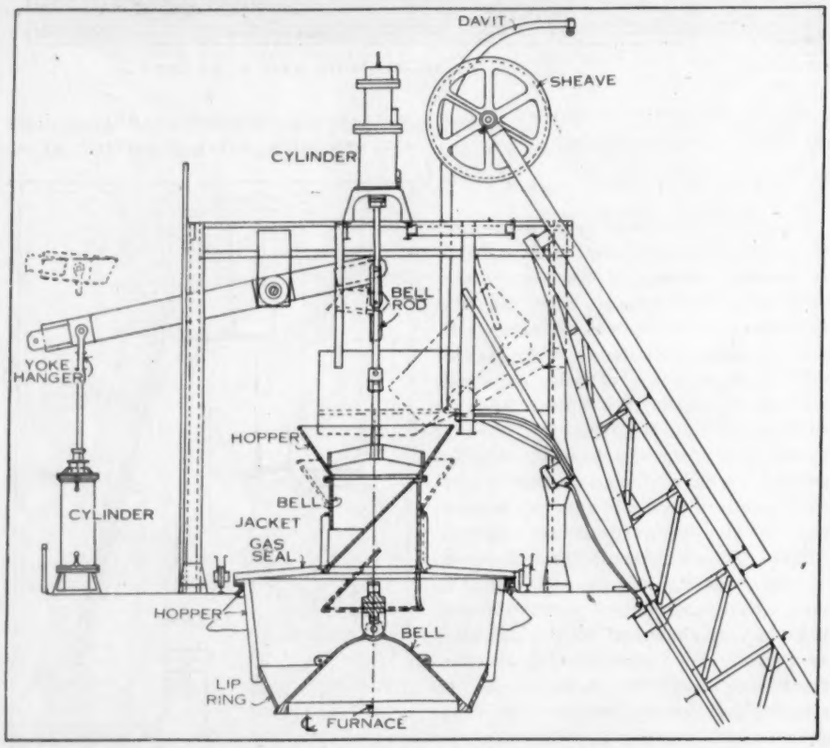


FIG. 13—DETAILS OF TOP CONSTRUCTION

On very fine work a lathe chuck or base plate is not removed from the lathe spindle nose until the job is finished. Remember that for extremely fine work it is impossible to screw a chuck or faceplate on the spindle exactly the same way twice. On fine faceplate work, the best mechanics take a light cut over the faceplate every time it is put back on the spindle.

Safety in Riveting

Several states are drafting safety appliance laws, among the provisions of which are requirements that riveting hammers embody in their construction devices to prevent the accidental ejection of the rivet set from the nozzle of the hammer. To meet this condition, the Ingersoll-Rand Co., New York, has designed a rivet set retainer. It consists of a single piece of heavy spring steel, closely wound into a spiral form. One end of this spring fits over the outside of the hammer and hooks over a projection integral with the nozzle. The other end is wound to a smaller diameter. Sets for rivets over ⅞-inch diameter are formed with a coarse thread and are simply screwed into place. Sets for rivets ⅞-inch diameter and smaller are formed with a shoulder and are slipped into the retainer while it is detached from the hammer, the shoulder holding it in place. The device is said to positively prevent the rivet set or piston from being driven out, even when the hammer is run free.

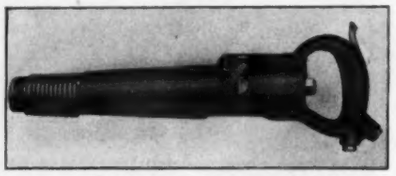


FIG. 1—RIVETING HAMMER WITH RIVET SET RETAINER

Other improvements also have been embodied in the Ingersoll-Rand riveting hammers. There is but a single ground joint between handle and barrel and these parts are securely held together by two bolts, one on either side of the barrel. This construction eliminates the need of a vise in taking the tool apart for inspection, a feature of value to the structural worker, as well as others who are not usually equipped with special facilities for repair work. There are no threaded joints on the barrel. The valve chamber is placed beside the cylinder and parallel to it, instead of in a line with it, thus obviating the possibility of injury to the valve by the piston. This construction gives a tool which can be used in close quarters.

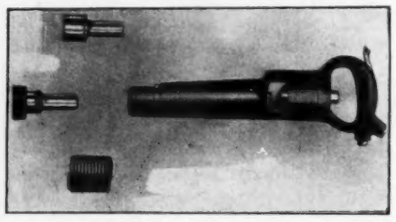


FIG. 2—RETAINER DETACHED, SHOWING TWO STYLES OF RIVET SETS

THE ABC OF IRON AND STEEL

Making Malleable Castings

BY DR. RICHARD MOLDENKE

FOR coarse work, such as railroad tie plates, the ordinary iron annealing boxes and the careful packing described in the preceding article can be omitted, and the castings piled up in the ovens, crowned with an arch to form a muffle, and fired in the usual way. This saves the expense incident to wasting away of the pots, boxes, or "saggers" as the completed set of boxes ready for the anneal are technically termed. In former times railroad couplers were occasionally treated this way, in fact it is a return to the old German method of annealing in the muffle furnace, but requires particular attention to see that no crack in the brickwork develops, so that air currents may circulate among the castings. This would mean a heavy wasting of the iron, warped work, and trouble generally. The muffle method is, therefore, recommended only with extreme caution. Careful firing in the case of the ordinary iron saggers, to avoid any but absolutely necessary air currents in the oven will prolong the life of the iron sufficiently to pay handsomely.

In annealing the hard castings, the ovens are brought up to temperature as quickly as can be, with due regard to possible overheating, the maximum temperature is maintained for 60 hours, and then allowed to drop gradually until the saggers are cold enough to open up slightly, when they cool further to a black-hot, and then the ovens are discharged.

From the annealing room, the castings, after being gathered from the floor upon which the saggers have been dumped, go to the soft rumbling room, where any scale adhering to them is cleaned off, and where a beautiful bright black finish is imparted to the work by tumbling it with small pieces of broken malleable—such

The following articles of this series previously have been published in THE IRON TRADE REVIEW: "Iron Ore and Mining Operations," Jan. 5; "Beneficiating Iron Ores," Feb. 2; "Rules for Figuring Penalties and Premiums on Lake Superior Iron Ores," March 9; "Transportation of Iron Ore on the Great Lakes," March 16 and April 13; "Ore-Handling at Lower Lake Ports," Oct. 12, 1911; "The Manufacture of Bee-Hive Coke," Jan. 4, 1912; "Pig Iron and Its Method of Manufacture," Jan. 2; "Manufacture of Wrought Iron," Feb. 6; "Manufacture of Crucible Steel," April 3 and April 10; "Manufacture of Open-Hearth Steel," May 15, 22 and 29, June 5 and 12; "The Rolling Mill Industry," Aug. 7, 14, 21 and 28; "Wire and Wire Rods," Oct. 2, 9, 16, 23 and 30, 1913; "Making Bessemer Steel," May 21; "Making Steel Castings," Aug. 6, 20 and 27; "Making Malleable Castings," Nov. 5, 1914.

SPOUT AND RABBLING DOORS IN AN AIR FURNACE

as test lugs from castings, etc. From the soft-rumbling room, the castings go to the grinding and chipping department, then to the straightening dies, if necessary, and finally to the warehouse and shipping department. It will be of interest to note that the more attention is given to the hard castings in the sorting room, in the way of removing fins, gates, etc., the less will be the necessary expense of grinding and chipping. The glass hard cast iron from the foundry is very brittle, and hence a few strokes of the hammer readily shape up the casting before the anneal, whereas the soft metal subsequent to this process needs time and labor to remove it successfully. With the above general outline of the malleable casting process, the points brought out below will be understood.

Character of Carbon in Annealed Castings

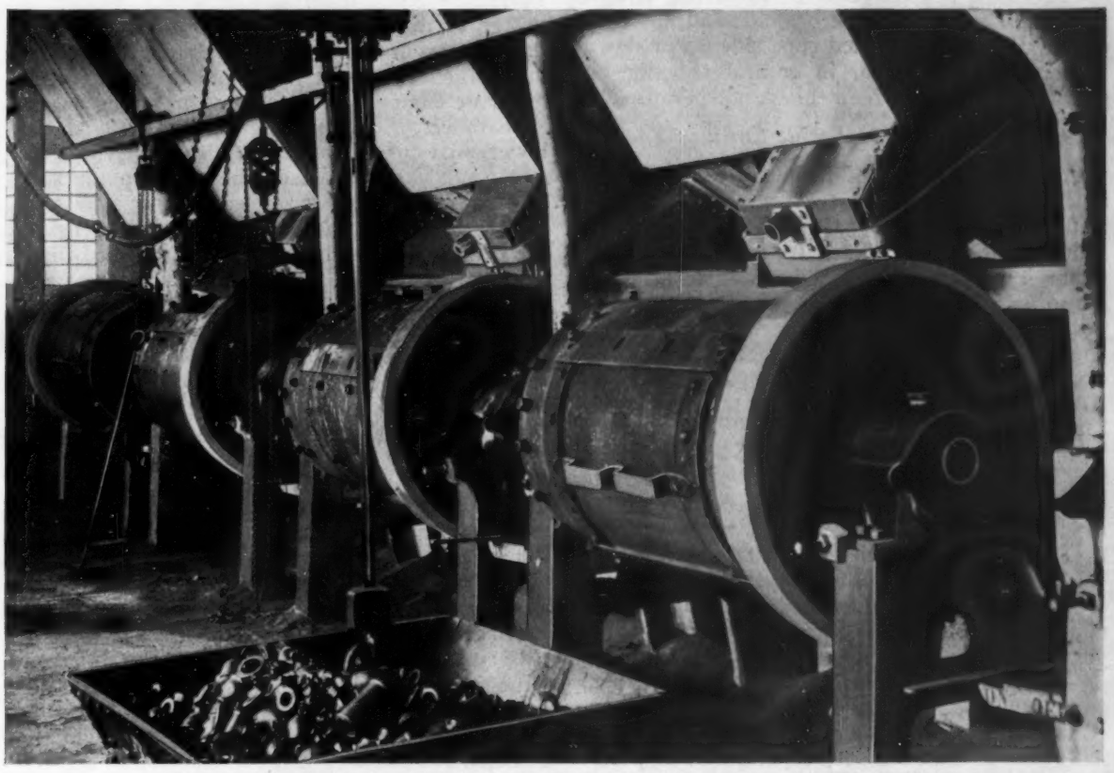
It has been stated previously that the carbon in the annealed casting is in the form of an amorphous graphite, called temper carbon. That it is amorphous is shown by the fresh fracture of a partly annealed piece in which it is easy to lift what appear like fine particles of lamp black from silvery surfaces, by using a needle and a microscope. That the carbon is graphite is shown by the glossy appearance of the finished castings as they come from the soft-rumbling barrel, in which they have been tumbled with pieces of annealed material. Usually this is brought about by saving the little "test lugs" placed on all important castings, and which are knocked off just before shipping and tested to be doubly certain that the castings are of good quality. By using these pieces instead of the usual "stars" of chilled iron, required for the hard-rumbling, the graphite-like surfaces are imparted to the castings being cleaned. For specially fine work, such as harness buckles, etc., and which may require silver or gold plating subsequently, scraps of leather are added to the barrels for rumbling, and a highly polished surface on the castings is the result. The importance of the above lies in the information it gives upon the physical structure of the malleable casting. A steel casting is made up of a succession of crystals of sizes and condition depending upon the heat treatment received, and cast iron is intrinsically a very bad steel, in crystalline form, of a carbon content corresponding to the combined carbon present, and with the graphite interspersed between the crystals of steel in the shape of sharp crystalline flakes. These crystalline flakes of graphite really so separate the sound portions of the structure that on straining the metal, cracks begin to form at these points. In the case of the malleable casting, the temper carbon seems to be in the shape of rounder masses without sharply defined planes of separation, the steel portions of the mass being more homogenous, and on subjecting the mass to heavy punishment, a distortion of the steel can take place without giving way, the temper-carbon particles forming cushions for the blows as received. This is actually the fact, and accounts for the remarkable resistance of the malleable casting to the repeated shock. Coupons cut from less exposed portions of malleable couplers, battered almost beyond recognition, show up the original strength of the metal, whereas, in the case of a steel coupler similarly punished, the strains would be transmitted beyond the ruined portion, and leave the metal weaker than it must have been originally.

CHARGING SPRUE INTO A LARGE AIR FURNACE

Another interesting observation along this point is the fact that the contraction of the hard metal as cast is ¼-inch to the foot, on the average, while the annealing process means an expansion of half this figure, so that patterns are made practically as for gray iron.

A further phenomenon of interest is to be noted in connection with the carbon removal from the surface of the castings as the result of the annealing process. It is an observed

fact that heating a malleable casting red hot enables it to dissolve the temper-carbon, and on quenching show a tool steel fracture. Since the temper-carbon of the malleable casting (corresponding to graphite in the gray iron casting) varies from nothing in the skin to the full percentage in the interior, the combined carbon remaining very low throughout the entire casting, heating such a casting red hot, and quenching, will show a succession of changes from skin to interior. The skin will remain soft, a little further in where the temper carbon was from 1 to 1.50 per cent, we get a tool steel fracture, and the file will not touch the material. Further in, we again have a soft material. This property has been taken advantage of for many years in making edged tools of malleable and selling them for steel. Wood-working chisels in particular will show the regular malleable fracture on breaking them away from the tempered portion.



HARD TUMBLING MILLS UNDER MOLDING ROOM IN A TWO-STORY FOUNDRY

Trouble From Excessive Shrinkage

One of the principal troubles noticed in malleable castings is due to the excessive shrinkage where sections of different thickness come together, and where there is an abrupt turn or angle. Again, it is almost impossible to cast a large flat surface and have all the metal in it sound. This comes from the fact that we are dealing with a metal which contracts very much as it sets. Furthermore, the low silicon irons are very difficult to keep in the molten state long, as the melting temperature is comparatively low, and even if they appear white hot in the fluid state, they are colder than dull red molten gray iron. The consequence is that the metal sets exceedingly quickly. In fact, it oftentimes has to be "thrown" into the mold to fill it up entirely. Naturally, under such circumstances, once the mold is filled, the thinnest sections set first, the gates freeze, no further metal can feed in, and a shrinkage must take place somewhere. This invariably occurs where the metal remains fluid longest. Hence the universal practice of placing "chills" at these points if it is imperative that the metal should be sound. The metal now sets first against the "chills", and the casting is safe. This means, however, that the shrinkage was sent to some other point of less importance.

This annoying characteristic of malleable also means that it is very difficult to get a sound test bar. Practice has shown that whereas in the case of gray iron a round bar is preferable, in the pouring of malleable work, the excessive shrinkage always prevalent in round sections causes better results to be obtained with flat ones. The metal sets against the sand first, the interior remaining fluid. The gate being much smaller in section than the bar, it freezes very quickly. The result is that the interior fluid material, which

cannot be augmented with fresh metal through the gate, and shrinking ¼-inch to the foot, becomes a honey-combed mass of iron, full of pine-tree crystals, and torn apart by successive planes of separation. Comparing a round section with a flat or square one, it will be readily seen that the latter will set comparatively quicker than the former, the four corners giving excellent sound metal at least. Compared with gray iron, this setting is much more rapid, and as no graphite separates out, the voids are much larger.

The malleable test bar should, therefore, be square, if 1-inch in thickness, and flat if of smaller thickness, remaining 1-inch wide. A round bar should not be used. Further, as the annealing process removes all casting strains and differences due to hot or cold sand, the bars can be cast flat and tested cope side up or down without discrimination, in contradistinction to gray iron test bars where this is not permissible.

Strength of Malleable Castings

As to the strength of malleable castings, this much may be said, the tensile strength of the metal will run from 35,000 pounds per square inch for the poorer grades, up to 52,000 for the best. The latter figure, however, is so often apt to go hand in hand with poor bending qualities, that a strength of about 40,000 to 42,000 pounds per square inch is preferable, if the elongation in 2 inches is at least 2½ per cent. It should run double that and often goes up to 7 per cent.

The transverse strength for a 1-inch square bar, tested on supports 12 inches apart, should be at least 3,000 pounds with a deflection of ½-inch. Actually, in exceptional cases, results have been obtained up to 5,000 pounds with 1½-inch deflection. But as stated, it is better not to expect the exceptional strength from a material which cannot hope to be uniform in physical structure on account of the shrinkage problem. In important cases it is far better to go up one step and take the steel casting.

The malleable casting industry being essentially one of much repetition work, it is peculiarly the field of the molding machine in some of its simpler forms. Particularly in the car casting branch of the industry, orders for ten to fifteen-pound castings may come in form of 50,000 wanted from one pattern. Probably when the permanent mold has been finally developed, and iron molds are better known and used, chilled iron casting, which is the malleable casting condition before annealing, should make the malleable foundry peculiarly its home.

Melting Practice

Referring now to melting practice. Cupola melting is comparatively simple, attention being directed primarily to prevent oxidation of the very low silicon metal used. With a fairly high bed, plenty of coke between the charges and no attempt made to skimp the fuel, an atmosphere free from oxygen is maintained in the cupola, and the metal will anneal all right though at several hundred degrees Fahr. above that for furnace metal which runs from 250 to 1,400 degrees Fahr.

As to air furnace iron, the following points should be observed closely: Charging should be so conducted that the sprues melt first, forming a pool of metal on the bottom. The pigs, instead of being charged haphazard, should be piled in orderly manner at either side of the central sprue pile, so that when melting begins the individual pigs may be readily dislodged and thrown into the molten bath by the melter. In this way practically half an hour of the time required to melt a heat is saved. This is highly important as every minute a charge of these low-silicon irons remains in the furnace longer than necessary under the oxidizing influences of the gases playing over them, tends to damage the castings for strength and appearance. The thin edge of the bath at the lower end of the furnace naturally suffers most, and as this part of the metal in the natural course of tapping comes out last, a heat of metal perfectly satisfactory at the beginning of the tapping process may be actually ruined three quarters of an hour later when the last of the heat is taken out. Not only has the silicon of the bath been lowered too much, but the absorption of oxygen has been such that the so-called "burnt" metal (high iron) is full of pin holes of gas, sets too quickly to fill the molds properly, and will not anneal satisfactorily.

On the other hand, malleable founders who are not fully posted on the metallurgy of their melting process, and realizing the danger attending long drawn out heats, go to the other extreme and take so much silicon in their mixture that a far worse situation results. The iron becomes "low" or too rich in silicon in the casting. The fracture therefore no longer shows up crystalline white, but is full of mottling and oftentimes entirely gray. Apart from the silicon, the question of temperature must be reckoned with, as a very hot iron tapped from the furnace and showing a white fracture in a given section when cast immediately, may become perfectly gray when the same metal is carried across the shop and poured cold. Hence the importance of working with the lowest silicon possible in the mixture to still come out safe in the castings. This means that the closest attention should be given the furnace manipulation. If it is remembered that the actual melting in any hearth furnace is not done with the flame by contact with the stock, but by the radiation of the brickwork heated up by this flame, it will be realized that the wall and roof surfaces should present an unbroken area as nearly as may be, without leaks of cold air and should be of the most refractory material. Again, in firing, an unbroken stream of burning gases, at their highest temperatures of combustion, should be pro-

(*Continued to page* 930b)

Flaming Arc in Steel Industry

A Discussion of the Relative Efficiency of Various Illuminants for Large Industrial Plants

BY ALLEN T BALDWIN

THE arc lamp has always been considered the one source of artificial light for the illumination of great areas, whether such spaces be within the walls of a building or not. It seems well at this time, when we are considering the most modern arc lamps, to determine whether or not they have retained their prestige as large area illuminants by keeping pace with the demands now made of such lighting. The well-known characteristics of arc lamps readily indicate that such illuminants could only be used to light small confined spaces at a great sacrifice of efficiency and convenience.

A conclusion concerning the merits of the flaming arc lamp as a lighting unit in the iron and steel industry can be drawn only after considering the capabilities of the lamps themselves along with a record of their behavior in actual service. This should include a comparison with other electric illuminants used in the same service.

The importance of reliability is appreciated and in the past the greatest objection to the long burning flaming arc lamp for service in the iron and steel industry has been on this score. Consequently, since the introduction of the lamps, close attention has been given to the perfection of both lamps and carbons that would prove more satisfactory in this respect. As a result, the improvements accomplished have tended to make the units more fool-proof and to minimize several inherent weaknesses.

At the risk of repeating facts that may already be well known a number of points bearing upon reliability will be brought forward at this place. Assuming the lamp and carbons will operate ideally, still these two parts must be put together as intended in order to obtain the satisfactory operation they are capable of giving. It is no more rational to expect a flaming arc lamp to burn as it should when carbons of incorrect length are used or the enclosure is not completed when trimming the lamp than it is within the course of wisdom to expect satisfactory service from an incandescent bulb operating either above or below its voltage range. The flaming arc lamp depends upon the consumption of impregnated carbons under definite conditions of current and enclosure to produce light. You, therefore, as users of these units are interested in knowing wherein the lamps and carbons themselves fall below the accomplishment of the end desired and in this the carbons, of course, eventually act as the indicators of any trouble that occurs.

Portions of a paper presented at annual meeting of Association of Iron and Steel Electrical Engineers, Cleveland, Sept. 14-19. The author is connected with the National Carbon Co., Cleveland.

Voltage Variations of Minor Importance

Voltage variations, which play such havoc with the incandescent bulbs, have a very minor part in the reliability of flaming arc lamps. The necessity for using high arc voltages that was a characteristic of early types of arc lamps disappeared with the perfection of the flame arc because it was shown that a quite constant current and a voltage limited by the desire for arc steadiness was most efficient. As a consequence, the modern lamps are built so that the current is held very constant and an arc voltage variation of 5 to 15 volts is neither unusual nor detrimental. This condition, obviously, makes these lamps particularly useful for service on power circuits, since under the greatest voltage variations ordinarily encountered, the unit will still be furnishing light ample to see the work.

By constructing the lamps so that they are not susceptible to voltage variations the current at the arc remains relatively constant and it has been found most satisfactory to keep it as high as possible, to obtain the greatest steadiness and reliability. The use of transforming devices by means of which alternating current lamps are made to burn with 10 amperes at the arc are the best illustrations of this development. At this time, lamps so constructed offer the greatest likelihood of showing continually reliable service. Periodic current fluctuations are not particularly harmful but the continuous operation of a lamp at a current considerably below the rated value for the lamp will result in more or less slag trouble. Operation at higher currents than the rated value will tend to insure reliable operation.

With the growth of experience obtained by using the early styles of long burning flaming arc lamps, numerous improvements have been introduced in the lamps all of which have ultimately added materially to their reliability. The construction of the moving and stationary parts has been simplified and made more sturdy. The glassware is of improved shape and not so fragile. The economizers are now made so as to aid materially in the steadiness of burning without contributing so much to trouble by means of the slag that accumulated on them. The mechanism is more accessible for inspection and repairing. The globe and condenser deposit from the present day carbons is most easily removed.

The so-called "robbing" of one lamp at the expense of another on 220-volt circuits when two multiple lamps were burned in series was a great weakness of the early flame arc lamps. This, also has been done away with almost altogether in the mill type lamps now available. A still further application of the idea of lamp construction, to minimize the effect of voltage variations, has been one of the methods used to avoid robbing. The introduction of automatic cut-out circuits is another method used to make the robbing periods short by breaking the arc through the cut-out and then allowing it to re-start. This second scheme is attractive, also, in that both lamps are not extinguished when one of the pair fails to burn for some reason. A third type of lamp is being used on 220-volt circuits, a multiple lamp taking about 3.5 amperes and 120 volts at the arc. Laboratory tests on this type of lamp have given satisfactory results as the following average of a series of six tests shows:

Life	Mean spherical candle power	Mean spherical candles per arc watt	Amp.	volts Arc
139.8 hrs.	1,459	3.5	3.5	119

The production of a reliable carbon has been assiduously studied with results that show satisfactory progress in the art of carbon manufacture. It would hardly be expedient to discuss just what steps have been taken to prevent the formation of lamp deposits that fuse readily, or the means by which carbons will accumulate less slag about their arc ends and will not respond so quickly to the harmful influences of low current or poor enclosure. Every phase of carbon manufacture that has any relation whatsoever to the production of a uniformly reliable carbon has been considered and is still being carefully studied. It would extend this paper to too great a length to discuss the care

with which each ingredient of the carbon is analyzed in the laboratory before being used, the methods of measuring the individual constituents of the carbons accurately, and the means of obtaining uniform mixing of the constituents before proceeding with the usual manufacturing processes.

Table I.

Tests on Incandescent and Arc Lamps

Building. Type lamp.	Watts per sq. ft. Initial test.	Watts per sq. ft. Deprec'n test.	Ave. foot candles. per watt. Initial test.	Ave. foot candles. per watt. Deprec'n test.	Lumens per watt. Initial test.	Lumens per watt. Deprec'n test.	Per cent initial illumination (ft. candles). Initial test.	Per cent initial illumination (ft. candles). Deprec'n test.
A—Tungsten	1.25	1.25	3.30	2.91	2.64	2.33	100	88.2
B—Flame arc.....	0.40	0.40	2.96	2.40	7.40	6.00	100	81.0

Depreciation Period.

4 months (approximately)—(Bldg. A)
100 hours (approximately)—(Bldg. B)

Steadiness

The arc lamp is gradually becoming a source of steady light. With those fluctuations which result from the movement of the carbons and the wandering of the arc being reduced by making these movements occur less frequently and for shorter intervals, a comparatively steady light is given by the latest flaming arc lamps.

The subject of cost of the illumination given by flaming arc lamps in comparison with vacuum and gas-filled Mazda lamps will now be considered. The data submitted has been collected from actual tests made by two different industrial organizations.

Comparison of Long Burning Flaming Arc Lamps and Vacuum Mazda Lamps

Two modern factory buildings of similar construction were selected for the tests. The buildings have a large window area and have white finished walls. Both buildings are used for machine work on large castings. The details of the test follow:

In building *A*, 500 watt alternating current multiple Mazda lamps with clear bulbs were used with various Holophane D'Olier metal reflectors. The lamps above the cranes in the center of the bay (hanging about 31 feet above the floor) were equipped with B.E.E. 500 bowl type reflectors, units hung at about 20 feet above the floor between columns at the center of the shop were equipped with R.E.D. 500 flat dome type reflectors and the angle reflectors R.E.L. 500 were used with lamps, also about 20 feet high, on the side wall brackets. The lamps had been in service five months and at the time of the first test they had not been disturbed since they were cleaned about four months before the date of the test. A series of readings were taken at each station on a plane 5 feet above the floor, the lamps and reflectors were removed, cleaned and replaced and a second set of readings were taken.

The building containing the arc lamps has two bays and the same general dimensions as building *A*. The lighting was furnished by 7.5-ampere, 540-watt, 69-cycle alternating current multiple lamps with transforming devices contained within the lamp to increase the amperage at the arc. The lamps were equipped with almuinum finished extension reflectors. The tests were made on a plane 5 feet above the floor. At first readings were taken at the various test stations with new trims in the lamps with clear globes. After 10 nights burning when the lamps were about ready to go out, a second set of readings was taken from the same stations. The results of all tests are given in Table I.

The comparative cost of the two installations has been tabulated and will be detailed here for your consideration. In figuring the economical advantage of the flame arc lamps over tungsten lamps, as a basis of comparison the flame arc lamp was considered 2½ times as efficient as the tungstens. This value, rather than the one above, is used merely for the sake of simplicity. Depreciation of apparatus and initial cost have not been considered although in this matter the greater line, transforming and generating capacity required by the tungsten system would tend to, if not entirely, equalize the higher initial cost for arc lamps. In this particular case the current cost was 1 cent per kilowatt hour. Tables at other costs are appended to illustrate the rapid way in which the economy of the flame arc lamp asserts itself as the current cost increases. The cost data are given in Table II.

The installations compared cover 13 arc lamps and seven tungsten lamps. Some exceptions might be taken to the items of trimming cost, globe breakage and repair cost. In this case, excepting the lamp repairs estimate, the figures represent the actual costs reported by the cost department of this company. Inquiries concerning the cost of these particular items included in a circular letter sent to lamp users generally brought forth the answer that they were at a minimum. One large installation of lamps of the early type made for service on 220 volt direct current lines charges each lamp with $2.63 per year for depreciation, labor and materials. The trimming cost in this plant is $7.87 per lamp per year. Another installation of over 50 of the latest lamps shows $2.60 for repairs, globe breakage, etc., and about $4.50 for trimming. While there is considerable discrepancy between the cost of the particular items referred to, they are the only ones that cannot be definitely stated for all installations, and the variations there could hardly be great enough to destroy the economy shown for flame arc lamps in this installation just detailed.

Table II.

Comparative Cost of Arc and Incandescent Lamps

	Flame arc lamps.	Tungsten lamps.
Burning hours per year	3,300	3,300
Watts for equivalent illumination	540	1,350
K. W. hours per year	1,782	4,450

Cts. cost of cur. per K. W. hr..	—1— Flame arc.	—1— Tungsten.	—2— Flame arc.	—2— Tungsten.	—3— Flame arc.	—3— Tungsten.
Total current cost for 1 lamp...	$17.82	$44.50	$35.64	$89.00	$53.46	$133.50
Carbons, 33 trims at 18c each..	5.94	.....	5.94	.....	5.94	.....
Trimmings, 33 times at 8c each.	2.64	.....	2.64	.....	2.64	.....
Inner globes, 2 per year.....	.78	.....	.78	.....	.78	.....
Repairs to lamps, estimated....	.75	.....	.75	.....	.75	.....
Tungsten renewals, every 1,000 hrs.—7½, 500 watts lamps at $2.48 net	.....	18.60	.....	18.60	.....	18.60
Cleaning reflectors every 6 mo..	.....	.35	.....	.35	.....	.35
Total maintenance cost per year	$27.93	$63.45	$45.75	$107.95	$63.57	$152.45
Saving per flame lamp per year.	.....	35.52	.....	62.20	.....	88.88

Fig. 1—General View of Power Development at McCall's Ferry, Pa.

Tide Water Hydro-Electric Plant

Description of McCall's Ferry Station Which Furnishes Power for the Maryland Steel Co.

BY C A TUPPER

THE OPERATION of plants at tidewater with hydro-electric power is something which a decade ago would hardly have been thought possible, as the energy of a large stream flowing into the ocean is not ordinarily utilized anywhere near its mouth. Yet this is what has recently been accomplished in the case of the Maryland Steel Co.'s mills at Sparrows Point, Md., and other metal-working plants in the vicinity of Baltimore. Power for the purpose is generated at McCall's Ferry, on the Susquehanna river, which is so centrally located that the same system may ultimately be extended as far as the industries of York, Harrisburg, Reading, Trenton, Norristown, Philadelphia, Camden, Chester and Wilmington. A line north as far as Lancaster, Pa., is, in fact, already in service.

The site of the power plant at McCalls Ferry, near Holtwood, Pa., has been under consideration for some years past, as a series of rapids above that point enable a head of 63 feet to be fully utilized. Steep banks on both sides of the river, and islands paralleling one shore so as to form a natural tail-race, also tend to make the site an ideal one for the generation of hydraulic power.

The Susquehanna river is, however, subject to a wide fluctuation of flow be-

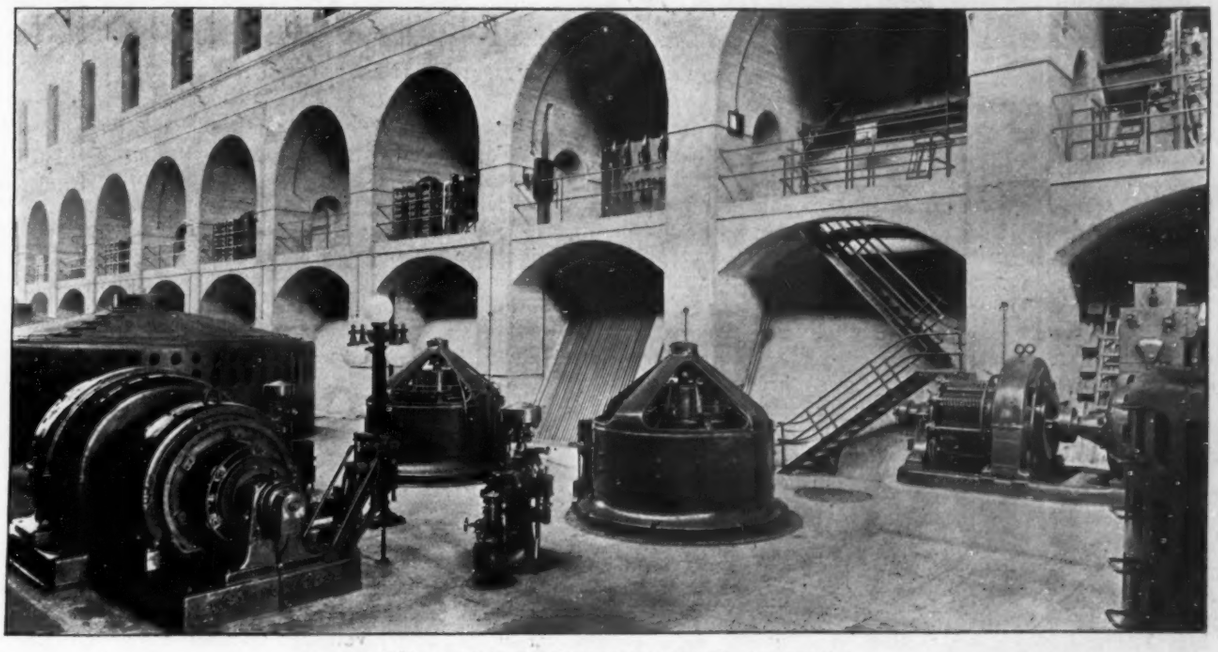


FIG. 2—EXCITER UNITS IN POWER STATION

tween the extreme of low and high water and heavy floods come on with great suddenness; hence it was necessary to provide for a strong dam, with an ample curving spillway. A dam 2,370 feet long, 53 feet high and 65 feet wide at bed rock has been built. It is constructed of solid concrete, except for layers of compressible material introduced every 40 feet to allow for expansion and contraction. A wing diversion dam, which with the aid of floating booms keeps logs, ice, etc., in the main channel of the stream, has been built at right angles to the main dam, so as to extend about 220 feet up the river. This has three submerged arches, through which the water enters the forebay of the station.

In all of the construction work interchangeable steel forms were used, and for the alternate sections which were built last, stop-logs having steel skeleton frames were substituted for coffer dams. A steel construction bridge with a total length of 2,000 feet, consisting of 40-foot spans, was also erected on the down-stream site of the dam and laid with steel rails, over which a traveler with extension arms was run to handle the steel forms and concrete material. For the tail race, the spaces between the islands referred to were simply filled by means of cribs and rock fills, and rock obstructions in the bed of the race were removed so as to allow the full utilization of the head.

The gate house for the power plant is divided from the forebay by a line of submerged arches, which also form the supports for the upstream wall of the station building, a concrete structure with steel roof girders. In the rear of these arches are the trash racks, which keep all debris from entering the turbines. They are supported on an incline from concrete piers. There are four inlets to the hydraulic turbines which merge in one huge intake 30 feet wide at a point 8 feet back of the headgates. The headgates, which have been made entirely of steel with the exception of the wooden bumper beams, are of special design facilitating quick and easy operation. They move on 9-inch gray iron rollers which are fitted in brass bushings. The rollers are lubricated by pressing grease through the axles from the centers of the bearings. Over the gates is a 5-inch motor-driven shaft made up of 20-foot lengths connected by standard flange couplings and so placed that the vertical racks on the gate stems engage on the shaft. The latter runs the entire length of the gate house and is capable of lifting the four gates as a unit, when required, in about one minute. In closing the gate it is disengaged and drops of its own weight, under control of a friction brake. There are two 30-horsepower motors for operating the shaft, and hand drive has also been provided for possible emergencies. A 15-ton crane spans the screen and gate room. The power plant has been laid out for an ultimate development of 135,000 horsepower; and all of the headworks, foundations, etc., are completed for that capacity, the only work required for the installation of additional generating units being an extension of the super-structure of the station. At present there are six hydraulic turbines and generators in service, each having an electrical output of 10,000 kilovolt-amperes.

The penstocks, wheel chambers and draft tubes have been formed in solid concrete. The vertical duplex turbines are of the Francis type, as built by the I. P. Morris Co., Philadelphia, and they have inward and downward flow. The two wheels composing each turbine are mounted on a single shaft, and the first units installed have roller bearings, while thrust bearings have been provided for the others. The draft tubes of the upper and lower wheels, which are separated, come out together below the level of the standing tail water, so that it is possible to get at the upper wheel simply by closing the headgates, but for the lower wheel the tail-race has to be shut off by stop logs and the water in the draft tube pumped out.

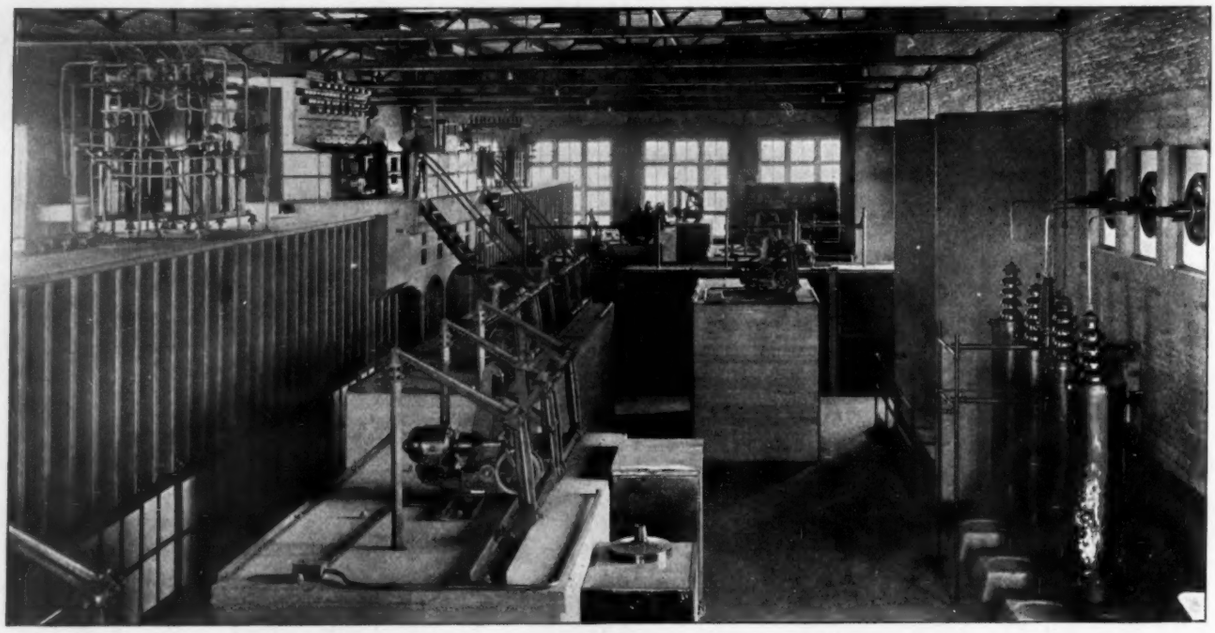


FIG. 3—INTERIOR OF POWER DISTRIBUTING STATION AT BALTIMORE

Of the six main generators, five are General Electric and one is a Westinghouse machine. Each is of the standard vertical waterwheel type, with revolving field, delivering three-phase, 25-cycle alternating current at a terminal pressure of 11,000 volts. They are Y-connected, with neutral grounded. The generator voltage is controlled by motor-actuated field rheostats and the excitation is automatically controlled by Tirrill regulators.

Energy for excitation is supplied by two 240-volt, 400-kilowatt, compound-wound generators and one 250-volt, 500-kilowatt compound machine, each being interpole units. The first

two are driven by small hydraulic turbines and the third by a 750-horsepower synchronous motor having the same characteristics as the generators.

The hydraulic governors are of the gear-actuated, double floating-lever type. Pressure for the governor system is furnished by five motor-driven, six-stage centrifugal pumps and one turbine-driven triplex pump, which are located in a basement under the generator floor. The drainage of this chamber is provided for by a slightly sloping floor, and there are also two small motor-driven bilge pumps to care for any excess. The six governor pumps take water through an inlet from the forebay and deliver it at 300 pounds pressure into 10, 8 and 5-inch pipe lines leading to three steel accumulator tanks on the generator floor. A motor-driven compressor supplies air to these tanks to create a cushion effect in the system. From the tanks the water under pressure is led to cylinders operating wicket gates which control the flow of water to the turbines. The admission of water to these cylinders and its release is regulated by the turbine governors, the speed of which varies as the speed of the turbines. The turbine-driven triplex pump was provided in addition to the motor-driven pumps for the purpose of having an emergency unit, should the electric circuit fail for any reason.

FIG. 4—INTERIOR OF MAIN GENERATING STATION

Transformer Arrangement.

Current from the alternating current generators is led through a double bus-bar switchboard system to nine General Electric and Westinghouse step-up, water-cooled transformers, which raise the pressure to 70,000 volts for transmission on the line. These transformers are delta-connected on the low-tension side and star-connected on the high potential side, with neutral grounded through resistance connected in series. Two of the transformers have a capacity of 7,500 kilowatts and the remainder 10,000 kilowatts each. The transformer house is located down stream from the generator room, on the same level, and is carried by arches spanning the draft tube outlets in the tail-race. It is, however, integral with the rest of the station structure. The transformers are mounted on trucks, so that when necessary they can be run out into the generator room for handling by the 100-ton crane. The walls dividing off the transformer house are entirely of reinforced concrete. The compartments are located along both sides of a 12-inch division wall, and the shelves and partitions are 4 inches thick. In addition to the main transformers there are two station service transformers stepping down current to 230 volts, also a 300-kilowatt testing transformer unit capable of taking current up to 300,000 volts. Storage batteries for emergency station service for the circuit breakers, and oil switches have also been placed in the transformer house.

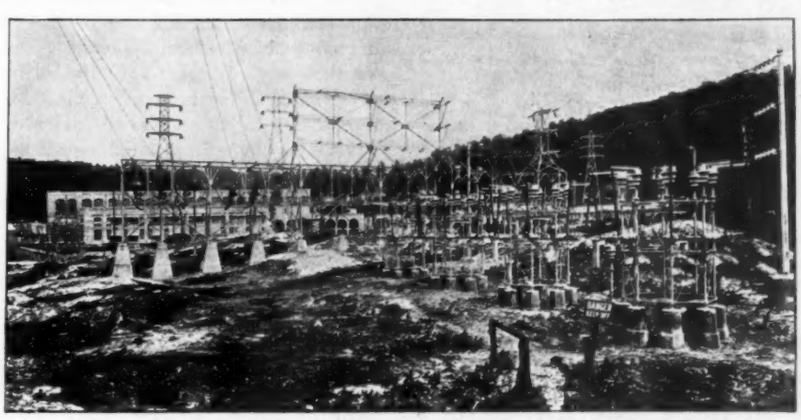


FIG. 5—ARC EXTINGUISHERS ON ISLAND NEAR POWER STATION

In the equipment of the power station provision has been made for six 70,000-volt outgoing lines and six 11,000-volt local feeders. The buses are copper tubing. Each generator delivers current either to the low-tension bus or to the step-up transformers, or to both at the same time. The oil switches are accordingly arranged in groups, each group including a generator switch, a transformer switch and a tie switch. Disconnecting switches are also so placed as to isolate any part of the transmission or control system for inspection of the apparatus. All of the high tension buses are in duplicate, sectionalized at the center and tied together at the ends by circuit breakers. This makes a complete ring bus that can be operated in any section or combination of sections. Any of the outgoing lines or transformers for long-distance transmission can be connected to any of the high-tension bus-bars by selective oil switches.

The plant and entire system are controlled from switchboards located in the galleries, which have been very completely equipped with all the apparatus to be found in modern stations. Horn-gap lightning arresters, with auxiliary equipment, have been installed where the lines leave the station, and on an adjacent island in the river there is an elaborate arc extinguishing system to minimize any troubles from electrical storms.

The 40-mile transmission line to

Baltimore, which passes over a private right-of-way 100 feet wide, is very substantially constructed. The cables are strung on four-legged galvanized steel towers, 415 in number, of which two principal types are used. Heavy section towers are necessary for spans over 700 feet or where there are angles in the line, and in straight, nearly level country one of these is included in every mile. The longest single span in the line, and one of the longest in the world, is 1,800 feet, mainly over water. The heavy section towers have each of their four legs bolted to angle irons set in concrete. For short spans and level country, except as noted, the light-section towers suffice. Each of the four legs of one of these is bolted to a steel tripod set 6 feet in the ground. Concreting was only necessary where the ground conditions were unusual. This seldom occurred. The standard height of towers is 44 feet to the lower crossarm, with an overall height of 62½ feet. It was, however, found necessary in rolling country to use extensions up to 20 feet additional in some places, so as to maintain as nearly a standard span as possible. A few special towers, up to 135 feet in height, were erected where required.

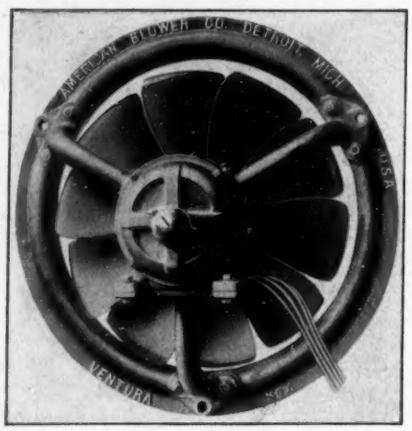
The lines are in duplicate, each set having three cables, which are of 19-strand aluminum, 300,000 circular mils in size, with a ground wire consisting of ⅜-inch double galvanized seven-strand steel cable. The transmission cables are suspended from the steel towers by strain insulators where long spans and angles occur and by suspension insulators in other places.

Sub-station at Highlandtown

The receiving and distributing station at the terminal is located at Highlandtown, Md., in the suburbs of Baltimore. It is built of brick and concrete, with compartments for the high-tension apparatus and transformers similar to those of the power plant. This sub-station has five 10,000-kilowatt, water-cooled General Electric transformers to step down the line voltage to 13,200 volts.

The ground floor of the building is taken up by the transformers and the high-tension bus compartments, mains, and station service transformers, together with a chamber with pumps for handling transformer cooling water and oil and vacuum pumps and air compressor. Along one side of the building is a standard gage railway track and a wider track with trucks for handling the transformers. All the piping is placed between and below the standard gage track in a suitable trench covered with reinforced concrete slabs. The transmission line entrances, high-tension oil switches, low-tension oil switches and bus compartments, outgoing feeder compartments, storage battery, battery panels and charging set are all on or accessible to ground level, with switchboard and meter panels on an elevated platform. There is an electric traveling crane for handling the transformers.

The two three-phase circuits of the transmission line enter through suitable protective apparatus. Lightning arrester horn-gaps are installed on steel towers outside, while the electrolytic cells are placed inside. Each circuit goes through disconnecting switches, choke coils and series transformers to a 70,000-volt automatic motor-operated oil switch, then through disconnecting switches to the two sets of high-tension bus-bars. From these, connection is made through disconnecting and oil switches to the high-tension side of the five 10,000-kilowatt transformers mentioned above, thence from the low-tension side to another set of buses and from these through disconnecting and oil switches to the three-phase outgoing feeder compartments. The leads leaving those compartments, made up into one 13,200-volt lead-covered cable, are taken through clay ducts to a cable vault and thence to a system of underground distribution.



NEW VENTILATING FAN

Sub Station at Steel Works

At the plants where the current is used, suitable apparatus for stepping it down to operating voltages or converting it to direct current are, of course, installed. In the works of the Maryland Steel Co., at Sparrows Point, there have been provided four Westinghouse 400-kilowatt, three-phase, 25-cycle, oil-cooled transformers, for reducing the potential to 2,300 volts and six Westinghouse 50-kilowatt lighting transformers, stepping down from 2,300 volts to lamp circuit pressures. There are also two 400-kilowatt rotary converters to furnish direct current for the mill, crane, hoist and other variable speed motors used in the works. These are wound for three-phase, 25-cycle, 2,300-volt current on the alternating current side, and 500-volt direct current is taken from the commutators. For the synchronous and induction motors and motor-generator sets used in the Maryland Steel Co.'s plant, current is applied directly from the alternating current system at 2,300 volts. Both the alternating and direct current circuits are tied to the systems previously in use, which will be held as a reserve. There is, however, no danger of a failure of the supply, except through an accident to the local distributing system, as arrangements have been made with steam power plants in the vicinity to serve as a standby for the hydro-electric lines.

New Ventilating Fan

A new type of ventilating fan has been recently put on the market by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The fan differs from the older style in having a large number of blades which are mounted on a wide central disk, with the ends abruptly turned up. The manufacturer claims that this design was adopted because it is quiet in operation. The air is thrown straight forward at high velocity instead of being widely spread out and no air can flow back through the center of the fan, which sometimes happens with other designs.

The motor is specially designed for this particular service. It is entirely enclosed and protected from dust, dirt, moisture, etc. It has a high overload capacity and readily drives the fan even against a strong back pressure from wind.

The American Rolling Mill Co., Middletown, Ohio, recently issued three interesting booklets which include many illustrations of roofs, ventilators, gutters, lath, culverts, pipes, etc., manufactured of ingot iron. One of the booklets, which is devoted especially to roofs contains an article on "Why Iron Roofs Resist Rust." Rules for estimating the amount of corrugated iron required to cover given spaces, tables of weights, etc., are included in the publications.

If a drill cuts larger than its diameter, it is poorly ground. Measure the length of lips and see that both lips are ground to the same angle.

Crucible Steel

In Annual Report Makes Unfavorable Showing

The annual report of the Crucible Steel Co. of America and subsidiary companies, for the fiscal year ended Aug. 31, 1914,, made an extremely unfavorable showing as compared with the previous fiscal year (which was the best in the company's history). The gross profits in 1914 were $2,991,602 against $6,958,130 last year and the amount available for dividends was $1,015,039 against $4,905,885 a year ago. The undivided surplus, after the payment of the year's preferred dividend 7 per cent, is $7,371,201.67. Comparison of earnings follows:

	1914.	1913.
Gross profits	$ 2,991,602	$ 6.958,130
Repairs and deprec.	1,316,322	1,698,163
Interest	609,486	300 486
Contingencies	50,756	53,595
Net profits	1,015,039	4,905,886
Div. paid on prfd. stk.	1.750,000	1,750,000
Undivided surplus	7,371,201	8,106,162

A condensed balance sheet as of Aug. 31 compares as follows:

Assets.	1914.	1913.
Property, equip., etc.	$45,385 609	$45,365,239
Invest. in ass'd cos.	8,167,291	7,221,424
Other invest.	200 100	.....
Current assets	10,909,210	13,127,547
Totals	$64,662,210	$65,714.210
Liabilities.		
Cap., prfd. stock.	$25,000,000	$25,000 000
Com. stock	24,578,400	24,578 400
Scrip div. held in treas.	2,033,845	2,087,775
Current liabilities	3.704,678	4,869,787
Reserve funds	1,072,086	1,072,086
Surplus	7,371,202	8,106.162
Totals	$64,662,210	$65,714,210

President Charles C. Ramsey says in his remarks to stoekholders:

"Owing to the unsettled business conditions throughout the world, brought about with such startling rapidity by the general European war, and the uncertainty as to the continuance of these conditions, it was thought best that the only proper policy to pursue was to conserve in every way possible the working capital and cash resources of the company, and to protect its credit until the effect of the war is more clearly determined. Earnings during the year suffered much from the depression and stagnation of general business at home and from the recent complete cessation of export shipments and payments abroad, but it was felt reasonable to assume that, with improved conditions due to the excellent crops at home and a fair freight-rate allowance given to the railroads by the government, a restoration of normal business should soon follow.

"Every effort is being made to extend the distribution of the products of the company in new directions, and to manufacture new lines previously supplied from the continent, not only because of present foreign curtailment occasioned by the war, but also through a desire to maintain our manufacturing activities to the highest point possible and to lessen the number of unemployed and the distress incident thereto.

"The entire direct loss of foreign business which to this company was large and also indirectly our domestic business through foreign influence, naturally affects our general income, our customers at home being unable to export their goods, thus decreasing their consumptive power of our products."

Obituaries

Robinson McConnel Cook, former plant superintendent for the H. C. Frick Coke Co., at Brownfield, Pa., died last week at his home in that city. He was born at New Alexander, Westmoreland county, Pa., Nov. 6, 1870.

Charles O. Kruger, president of the Philadelphia Rapid Transit Co., dropped dead at the Racquet Club, in Philadelphia, Nov. 4, from an attack of heart disease. Mr. Kruger entered the traction field in 1885 as secretary and treasurer of the Pennsylvania Traffic Co., a subsidiary of the Cambria Steel Co., and by gradual advances rose to his present position.

Henry H. Boggs, for eight years manager of the Detroit branch of the Strong, Carlisle & Hammond Co., machinery, Cleveland, is dead at the age of 47. He was one of the best known men in the machinery industry in Detroit, where he had business interests for two years before becoming identified with the Strong, Carlisle & Hammond Co. Prior to his connection in Detroit, Mr. Boggs was associated with similar organizations in Ohio. He was well acquainted with details of the machinery business, having worked as a machinist in his home city, Springfield, O.

Block Pavement Orders.—Ayer & Lord Tie Co., Chicago, has just closed a contract with the Reo Motor Car Co., Lansing, Mich., for 3,545 yards of creosote block pavement for a new tin shop being erected at that plant. The same firm has just received a third order for creosote block pavement from the Commonwealth Steel Co. at Granite City, Ill., calling for 1,000 square yards.

Bollinger Bros., manufacturers of coal handling equipment, are completing a new plant at Economy, Pa.

Many Plants

In Detroit Working With Reduced Forces and Short Hours

Detroit, Nov. 10.—Industrial conditions in Detroit are exceedingly unsatisfactory and depressing right now. Conservative estimators place the number of men out of work at 20,000 and, apparently, there is little chance of these men being given places through the winter months; in fact, there are some institutions of industry that are now planning to open in the spring—and not before. These factories include automobile plants, accessory plants, wooden box plants, etc. One of the best indications of the "poor times" is shown in the extraordinary number of houses advertised for rent and sale. A prominent real estate operator declares there are 3,000 flats vacant in Detroit, 1,000 houses and a corresponding number of apartments. This is plain evidence that thousands of families have already started "doubling up" for the winter so as to reduce expenses.

Some big industrial plants have gone so far as to let out all help, excepting superintendents, yard watchmen and only such office employes as are absolutely needed. One local concern that under ordinary circumstances employs approximately 1,500 skilled workmen has cut its force to the bone—has even let out its two telephone operators so as to eliminate the "overhead". One of Detroit's largest automobile plants has cut its force from several thousand workmen to a bare 500.

These motor car companies are running heavy: Ford, Cadillac, Packard.

Detroit has many and varied industries. A city with a population of 625,000, such as the Michigan metropolis claims, cannot get away from numberless factories, yet Detroit, in the main, depends upon the automobile industry for its prosperity. When the motor car plants are running heavy, all other industries seem to be in good shape—and vice versa. Big chemical concerns are here and these are directly affected by the European war. The Parke-Davis company, which lends employment to thousands, has been forced to curtail its output from some departments because of the failure to get herbs and other necessities for the manufacture of drugs.

Figuring on the basis of 75,000 men being employed in automobile and automobile accessory plants in Detroit and figuring four persons to a family, it can be seen that close to 300,000 persons are dependent on the motor car industry in this city alone.

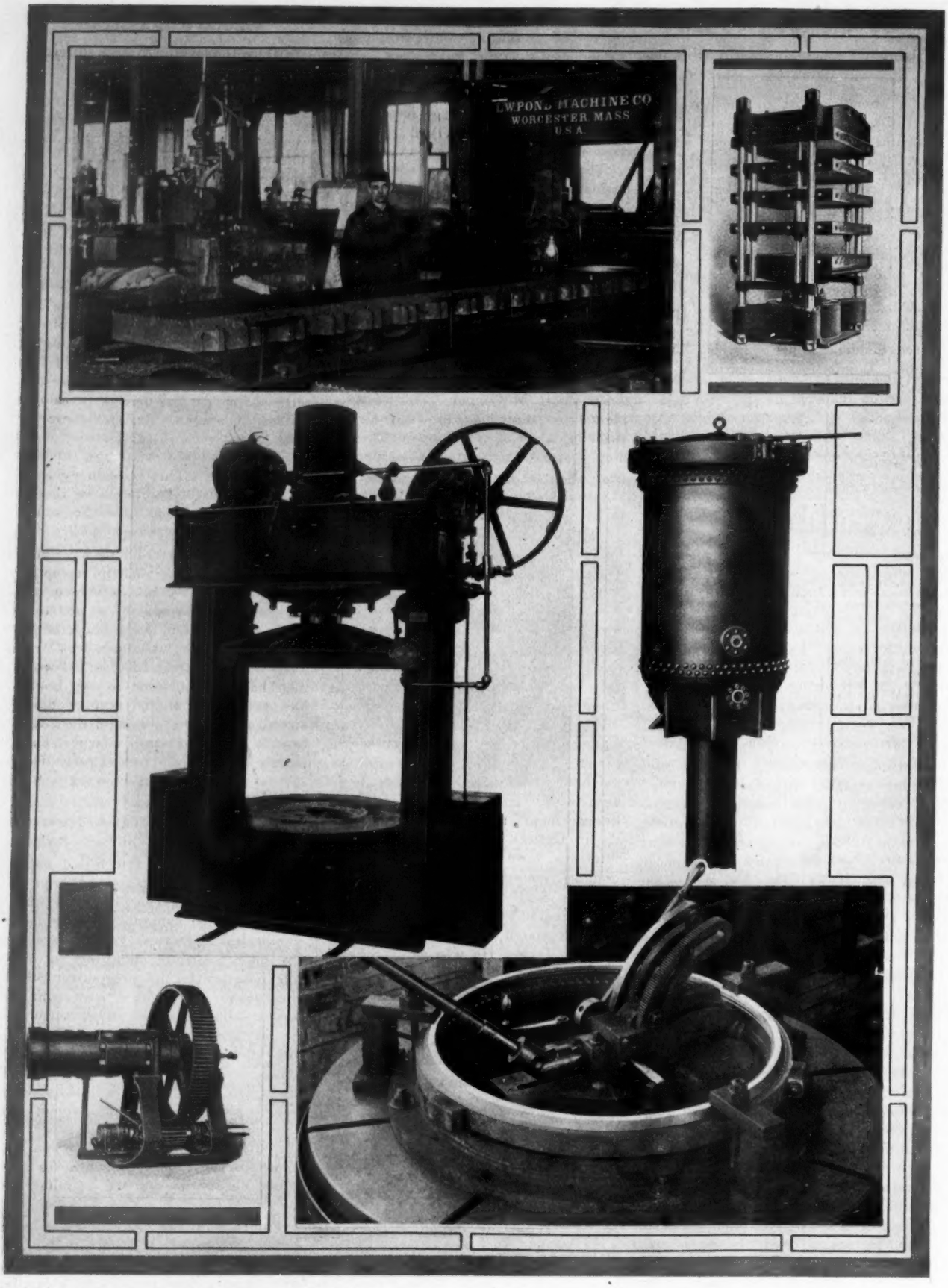


FIG. 1—PLANING A STEAM JACKETED HOSE MOLD

FIG. 2—HYDRAULIC PRESS

FIG. 3—HYDRAULIC FORCING PRESS

FIG. 4—HYDRAULIC VULCANIZING PRESS

FIG. 5—TUBING MACHINE DRIVEN BY FLOOR SHAFT

FIG. 6—MILLING TREAD RING OF TIRE MOLD, 1,100 MOLDS ARE MILLED DAILY

How Rubber Machinery is Made

The Adamson Machine Co. Has Developed a Complete Line of Rubber Molds and Machinery as Well as Light and Heavy Castings

THE meteoric rise of the automobile business carried with it many complementary industries. The latter were steadily confronted by a heavy demand for products which previously had been sold only in comparatively small quantities, and they were taxed at first to find suitable equipment and machinery to enable them to fill orders. Among these industries that of making rubber machinery and rubber molds, to supply the enormously increased demand for rubber products, was one of the most important.

The Adamson Machine Co., Akron, O., was among the first to recognize the importance which the rubber industry had suddenly assumed. While continuing to carry on its manufacture of both light and heavy gray iron and converter steel castings, the Adamson company began to specialize on the manufacture of rubber molds and rubber machinery. As a result, it has developed a very complete line of this equipment, as shown by the illustrations on the opposite page. Among its products are tire molds, bead molds, steam-jacketed hose molds, tubing and straining machines, hydraulic presses, hydraulic vulcanizing presses, hydraulic forcing presses, accumulators, vulcanizer heads, etc.

In Fig. 6 is shown one of the initial steps in the making of the non-skid tire. The machine, which is milling the molds on the tread ring for a non-skid tire was developed by the Adamson company. The speed of operation is shown by the fact that three or four tread rings are milled on one machine in an 8-hour day. There are three circles of these small molds on each tread ring, each mold averaging about three-fourths inch in width and one-fourth inch in depth. There are 105 molds in each row, making 315 milling operations on each tread ring, or about 1,100 in one day.

A molder in the foundry can make six or seven tire molds in a day. The molds consist of three pieces, a tread ring and two side pieces. Their weight varies from 400 to 1,000 pounds. They are cast in iron flasks against a chill. Prior to the milling operation, they are bored on a 48-inch Gisholt boring mill. The milling machine is driven from countershafting through two universal joints. The operation of the machine is automatic, the number of molds being governed by an index plate and the depth being controlled by a stop on the cutter spindle.

The steam-jacketed hose mold shown in Fig. 1 is 20 feet long and 26 inches wide and weighs about 8,000 pounds. It is being planed on an L. W. Pond planer. This is a two-part hose mold, the upper half being shown in the foreground of the illustration. An average of 18 or 20 grooves of varying depths are planed on these molds. The two parts of the mold are held together by means of T-head bolts carried in lugs on the sides. Steam is admitted into both parts through a number of small openings around the sides.

For making special rubber work, the tubing machine shown in Fig. 5 was developed by the Adamson company. This is built in sizes from 2 to 12 inches. A large screw driven by a gear wheel forces the rubber through holes of the size desired.

The hydraulic press shown in Fig. 2 is provided with steam-chambers in all of the platens, for use in vulcanizing and cold pressing tires. These presses are built in both the two and four-rod type in sizes from 16 x 20 inches up to 60 x 60 inches.

A development of the motor truck industry is the hydraulic forcing press shown in Fig. 3. The press illustrated has a capacity of 150 tons. Tires on motor trucks are integral with the tread ring, and when replacement is necessary a new tread ring carrying the tire must be forced onto the wheel. The bottom platen of the forcing press rests on rollers. This platen is run out in order to facilitate placing the wheel on the press. The press is self-contained, carrying its own pump, tank etc. The hydraulic vulcanizing press illustrated in Fig. 4 is used for curing tires.

Increased demand for its gray iron and converter steel castings and its rubber equipment has forced the Adamson Machine Co. to double the size of its foundry, this work being now in progress. The present foundry is 80 x 160 feet, and an addition of equal size is being erected. The foundry is served by two 15-ton Cleveland cranes. The cupola which was furnished by the Northern Engineering Works, Detroit, is lined to 39 inches. For making steel castings, the foundry is equipped with a 3-ton converter furnished by the Oil City Boiler Works, Oil City, Pa.

The company's machine shop was recently doubled in size. The machine shop is 80 x 400 feet and is equipped with a complete line of machine tools. It also is served by two 15-ton Cleveland cranes.

Many Cities

Including Lorain Talked of for Armor Plate Plant

Washington, Nov. 10.—Preliminaries attendant upon the investigation as to the cost of and a suitable site for a government-owned armor plate plant have been taken. The investigation is to be made up of a board represented by Rear Admiral Strauss, chief of the bureau of ordnance, navy department, Senator Tillman and Representative Padgett, chairmen of the senate and house naval affairs committees respectively. Rear Admiral Strauss said that he has held two conferences with Senator Tillman and Representative Padgett in regard to the investigation.

Among the numerous cities which have been named as points for locating the armor plate plant is Lorain, O. Dispatches have been printed that Secretary Daniels will recommend that the plant be located there, having given this promise to former Representative William G. Sharp, of Ohio, before he went to Paris as American ambassador.

"To start with," said Secretary Daniels, with a cryptic smile, "we have to catch the rabbit—in other words, we have to first get permission from congress to build an armor plate plant. In the second place, I never told Mr. Sharp that I would recommend that the plant be located at Lorain, but did tell him I would be glad to receive arguments favoring that point and that his recommendations would have great weight."

About 250 members of the Engineers' Society of Western Pennsylvania attended a smoker, Nov. 6, at Hotel Schenley, Pittsburgh. Several officials of iron and steel companies in the Pittsburgh district took part in a vaudeville program.

Business News from the Capital

President and Cabinet Co-operate With Federal Reserve Board to Aid Steel and Railroad Industries—Interstate Commerce Commission Investigates Embargoes

Washington, Nov. 10.—Assurance by administration officials that the industrial and financial situation throughout the country is rapidly resuming normal proportions is marred by their knowledge that two industries have been unable to regain their activity. One is the iron and steel and the other the railroad industry. It is known to be the position of these officials that the complete prosperity of one is dependent upon the prosperity of the other. In this connection it has developed that President Wilson, members of his cabinet and other officials are striving to find a remedy for the great ill affecting the iron and steel business. It is known, too, that they entertain the idea that if the Interstate Commerce Comission could see its way clear to act favorably upon the application of the Eastern railroads for an advance in freight rates, the iron and steel industry would at once take on new life.

The contention is made that this advance would result in bringing the railroads into the market for iron and steel equipment. It is no secret that officials of the administration, emphatic in their position that the railroads are deserving of the increase, are holding conferences with members of the commission to convince the latter of the need of the railroads for higher freight rates.

After pointing out what has been done in the direction of solving the financial problem, and what has been and is being done to relieve the cotton situation, a member of the Federal Reserve board said that information gathered by the administration shows that the iron and steel industry and the railroads are the only lines which continue to sag. With this knowledge at hand, the President, and members of his official family are co-operating with the Federal Reserve Board to study further the problems confronting these two lines of industry and see if something cannot be done to infuse life into them. The rate situation is taken as one of the big problems which has to be solved.

Secretary of the Treasury McAdoo is reported to be extremely desirous of seeing the carriers get higher rates so that they might obtain more revenue, enhance their credits, and increase their purchasing power. The officials have intimated strongly that they do not presume to bring any undue pressure upon the commission, but at the same time wish to make it clear that, if it can properly grant an advance in rates, it should do so as early as possible, as it will have a salutary effect upon the iron and steel industry, as well as upon the railroads. In the original 5 per cent case decision, Commissioners Daniels and McChord, in their dissenting opinions, were favorable to the increases, and supposedly are still of that mind. Conversion of two members to that belief would mean a majority of the commission favoring the increase.

Investigation of Embargoes

Washington, Nov. 10.—A statement has been sent out by the Interstate Commerce Commission explaining that it is not able to outline in advance the exact scope or extent of its investigation in the matter of embargoes. The hearing will be held in Chicago, Jan. 20. The announcement was prompted by a number of communications requesting information as to the scope of the investigation. After pointing out what action has been taken by the Board of Railway Commissioners for Canada with respect to embargoes, the statement says it cannot be said, of course, that the investigation of the commission will result in a similar order. The commission wishes to receive from both the carriers and shippers information as to the necessity for embargoes, their frequency, their misuse, if any, their advantages, the practicability or impracticability of requiring carriers to notify the public generally as well as the commission of each embargo, either before or after it takes effect. Further, the commission wishes information which will assist it in determining whether or not it is advisable for it to take any action in the premises.

The New Trade Commission

Washington, Nov. 10.—About to pass out of existence in name only is one of the most important branches of the government having to do with the manufacturing and general business interests of the country. On the eve of superseding it, or really supplementing it, is an organization which will have vast powers, and upon its personnel rests the power of much good or much evil.

This transition is the passing out of the Bureau of Corporations and the coming into being of the Federal Trade Commission, created by the long session of Congress recently ended, and constituting one of the two anti-trust bills of the administration program. Briefly, the Federal Trade Commission will be the Bureau of Corporations under a new name and with greatly extended powers.

The bill creating it has been referred to as a menace providing for the appointment of "business spies," "busybodies" and "prying Toms." Conversely, it has been characterized as a splendid piece of progressive legislation, which, if competently carried into operation, will be of emphatic aid to the business interests that are living up to the law, and a power for swift punishment of violators. Although part of the administration program, it did not become a partisan measure. Republicans and Democrats alike voted for it in both the Senate and the House. Such prominent men as Minority Leader Mann of the House voted for and praised the bill and took occasion to say Democrats could not claim all the honor for its creation, because Republicans had worked for the principles it establishes. Indeed measures of similar character were introduced many years ago, one by Senator Moses Clapp, Republican, and one by Senator Newlands, Democrat, under the administration of former President Taft.

It was contended, in framing the present bill, that experience in the execution of the law, as shown in the Standard Oil and American Tobacco decrees, and in the frequent efforts of combinations to make voluntary adjustments with the Department of Justice, established that the question involved is administrative as well as legislative and judicial. This being the view taken, it was held indispensable that some of the administrative functions should be lodged in a body specially competent to deal with them, by reason of information, experience, and careful study of the business and economic conditions of the industry affected.

The Senate committee on Interstate Commerce, of which Senator Newslands is chairman, in its report of the Federal Trade Commission bill, maintained that the knowledge of the law and the information as to the facts are not likely to be entirely adequate for the determination of the best form of dissolution, and this has been recog-

Business News from the Capital

Federal Trade Commission Replaces Bureau of Corporations—New Board Will Have Greatly Extended Powers—President's Friend Seeks to Aid American Trade

nized both by the Supreme Court and the Department of Justice. Preliminary to the judicial determination of such questions as arise, it was pointed out, for example, in the examination of proposals for a voluntary dissolution of a combination or in testing the lawfulness of existing business arrangements, a vast amount of information in numerous branches of industry, as well as expert knowledge, is indispensable. Further, it was claimed that the proper enforcement of the Sherman law also requires vigilant supervision which is most effectively obtained by a body in continual touch with the business organizations in the various industries. It was therefore concluded the trade commission was necessary to respond to a general need.

The report, which will not meet with concurrence in the entire business world by any means, says, among other things, that "if this commission had been in existence during this period (when the Interstate Commerce Commission was established) we would not have to deal with such organizations as the United States Steel Corporation," etc. The idea of the report is that such a commission would have at least kept in limited bounds the activities of a multitude of price-fixing associations, etc.

The Bureau of Corporations was established by an act of Feb. 14, 1903, and provided in some measure for the description in detail of conditions in particular industries, and other facts. The field has necessarily been restricted and the Bureau's organization as a division of an executive department under a single head reporting to the President, has not given to it either the authority or prestige which attaches to an independent body, as the Federal Trade Commission will be, whose primary purpose, it was pointed out, is for the preservation of competition and the practical enforcement of the law. It will have sufficient power ancillary to the Department of Justice to aid it in the enforcement of the Sherman law and to aid the business world as well, and supply information for both the government and business interests.

The commission will be comprised of five commissioners with a regular term of seven years. President Wilson has said that he will name these commissioners in December, and prediction is made that Joseph E. Davies, now head of the Bureau of Corporations, will be named as one member of the board. Other members are expected to be selected from among expert economists, railroad men, lawyers and corporation men. Its decision, coming from a board of several persons, it is claimed, will be more readily accepted as impartial and well considered than is the work of the Bureau of Corporations, and moreover, it is proposed that it shall be absolutely non-partisan, the measure providing that not more than three members shall belong to any one political party. It is obvious that the men to be chosen must be of unusual ability.

Specifically subject to the jurisdiction of this commission are all corporations, trade associations and corporate combinations engaged in interstate and foreign commerce, excepting banks and common carriers. It has power to investigate the organization, business, financial condition, conduct, practices, and management of any corporation subject to the act which it may designate, and its relation to other corporations and to individuals, associations, and partnerships, and to require the production of information. The commission may make public information it obtains except as to trade processes, names of customers, and other matters not deemed of public importance and may also make annual and special reports to Congress, including recommendations for additional legislation. Reports are required only from such corporations or classes of corporations as may be designated by the commission. There are more than 350,000 corporations in this country, of which perhaps a large percentage is engaged in interstate trade, but it must be realized that the number affected by this new law will not exceed 1,000. It is meant, according to its sponsors, to be "persuasive and corrective rather than punitive so far as well-intentioned business is concerned."

THE IRON TRADE REVIEW has heretofore analyzed the provisions of the bill, showing how the commission is authorized to aid the courts in the form of the decree to be entered and to make investigation as to the manner in which such decrees are being carried out, as to whether they are being violated, and what, if any, further order, decree, or relief is advisable, reporting to the attorney general. Likewise, it has been pointed out that the commission may investigate trade conditions abroad as well as in this country, and likewise the provision relating to unfair methods of competition was dealt with.

Co-operation Sought by President

Washington, Nov. 10.—Charles Ferguson, acting as the representative of President Wilson and of the Department of Commerce, is conducting what is described as an education among the business men of the country. Just at this time he is in New York. The message he is conveying from the President is to the effect that "the administration expects a great revival in American economic life to proceed from the spontaneous enterprise of the business men themselves, and has no notion that any very grave or affirmative change can be wrought by legal pressure from the outside".

Mr. Ferguson has explained that he will give to business men the results of the study he has made of the relations between business and politics in Europe and tell how lessons drawn from the war may be applied in this country. Particular emphasis will be laid on the work of the Bureau of Foreign and Domestic Commerce. Merchants will be asked for their co-operation in making the bureau the biggest force of its kind. Suggestions and criticisms will also be sought.

Mr. Ferguson has been given the following letter by President Wilson:

"The bearer of this letter, Mr. Charles Ferguson, is a friend of mine in whose character and gifts I have peculiar confidence. He is acting as the representative of the Department of Commerce of the United States. I bespeak for him the most cordial and intelligent touch with the plans consideration."

Mr. Ferguson spent the last year in Europe making a careful study of economic conditions for the President and the Department of Commerce. He says that he is to emphasize the fact that such legal pressure as is applied is in its nature temporary and provisional and that "the big things are to be done by the business men and bankers themselves."

He aims to secure co-operation that will be helpful in making the Bureau of Foreign and Domestic Commerce of extraordinary value to business. He will visit numerous large cities.

Business News from the Capital

Interstate Commerce Commission Grants Industrial Railroads Right to Receive Allowances From Trunk Lines

Washington, Nov. 10.—Now that the Interstate Commerce Commission has reversed itself and given "common carrier" steel rail lines the right to receive switching charges or divisions of joint through rates from trunk line roads, much interest is being shown in the arrangements which will be entered into between the industrial and trunk carriers for the allowances or divisions to be granted. The commission points out specifically that it will undertake at the earliest opportunity to inquire carefully into any of these allowances or divisions which may seem to be unwarranted or unreasonable or to effect unjust discrimination. Each case is to be judged by its own facts and merits.

"Each of the industrial railways," says the commission in its supplemental decision in the industrial railways case handed down last Friday, "is or is not a common carrier. If it is a common carrier, it is entitled to all the rights and subject to all of the limitations provided in the act to regulate commerce."

In the original decision, prepared by Chairman James S. Harlan, allowances granted to the steel lines were held to be unlawful and to constitute rebates. But since then the Supreme Court handed down its decision in the tap line cases, reversing the decision of the commission, and giving southern industrial roads serving lumber mills the right to resume a division of joint rates with the trunk lines. The divisions later determined upon were less than those originally enjoyed by the lumber lines.

It was upon the strength of the Supreme Court's decision in the tap line cases that the commission modified its original report in the industrial railways case, basing its supplemental findings in accordance with principles announced in the tap line cases. The commission says that in fundamental principles the industrial railways case does not differ from the tap line cases, although there may be a distinction as to application of the commodities clause, "but that cannot properly affect the conclusions or action of the commission." It is pointed out that, "if the commodities clause is violated, that infraction of law is not to be corrected or punished by rate adjustment." At another point, the report says, "if infractions of that law come to our notice, we shall in the proper way, bring them to the attention of the Department of Justice."

The supplemental report was prepared by Commissioner Edgar E. Clark, while Chairman Harlan dissents, and indicates that he is not convinced that the original decision was in error. He urged that an order should have been issued on the basis of the original report "so that the matter can be taken into court and be judicially reviewed, and some definite principle established by which we may be guided in the disposition of the many similar cases now pending before us and that may hereafter arise." Reviewing the finding of the majority, he comes to the conclusion that the commission brings the case back to the point where it started, nearly four years ago.

The Majority Opinion

The majority says, however, speaking of developments following the original decision, when United States Steel Corporation companies and lines, and industries which they serve other than their own, as well as independent steel lines, sought to have an order entered:

"Our findings in the original report in the instant case have been given general and substantial effect by trunk line roads. The withdrawal of allowances to many of these industrial railroads seems to have been accepted as proper without much question, but as to a few of them there is insistence that our findings invade the legal rights of the so-called industrial roads, and we are urged to issue an order so that those questions may be tested in the courts. We have concluded, however, that it is our duty to refrain from issuing an order and to avoid the delay which would be attendant upon such litigation. We think that in the light of the decision of the Supreme Court in the tap line cases it is our duty to so modify our findings in the original report herein as to permit the trunk line roads, if they so elect, to arrange by agreement with any of the industrial roads mentioned in our former report which are common carriers under the test applied by the Supreme Court in the tap line cases, and which perform a service of transportation, for a reasonable compensation for such service in the form of switching charges or divisions of joint rates. Each road that becomes party to such an agreement must file with us immediately upon the consummation thereof a full statement of the arrangement entered into showing specifically the allowances or divisions granted thereby."

The report points out that the commodities clause excepts timber and manufactured products thereof from the prohibition against the transportation by a railroad of any article or commodity manufactured, mined or produced by it or under its authority, or which it may wholly or in part, or in which it may have any interest, direct or indirect, except such articles or commodities as may be necessary and intended for its use in the conduct of its business as a common carrier.

It will remain for the steel lines to be accepted as common carriers under the test applied in the tap line decision of the Supreme Court. It would seem, in view of different decisions by the commission, notably that in the case of the Manufacturers' Railway of St. Louis, passed upon in a supplemental proceeding last week, that so-called interchange switching service at the plant, such as is done, for instance, by the Youngstown Sheet & Tube Co., the Republic Iron & Steel Co., Wickwire Bros., etc., will be entitled to compensation for switching cars from trunk lines on their own plant tracks. In the Manufacturers' Railway case, the commission said that line, owned principally by and serving exclusively the plant of the Anheuser-Busch Brewing Co., may receive $2.50 for each car it handles from the trunk lines for the switching service performed.

Point to be Settled

It will be interesting to see how many, if not all, of the steel roads performing regular line hauls and other service will be given the privileges of allowances or divisions. This is a contentious point, but it has been interpreted by some that the commission is of the opinion that there will be comparatively few. The divisions and allowances granted to industrial roads were estimated in the original decision at $15,000,000 per year. Chairman Harlan then deplored the granting of these so-called privileges, which were then termed un-

lawful, as depleting the revenues of eastern trunk lines which were then and are now seeking a 5 per cent increase in rates.

The Supreme Court in the tap line cases established a liberal principle as to what constitutes a common carrier, and from this many take the view that a great portion of the steel lines will experience no difficulty in establishing their right to come under that category, instead of being "plant facilities merely", as they were originally described.

The Supreme Court, commenting on the commission's finding with regard to the lumber roads which were held not to be carriers because most of their traffic is in their own logs and lumber and that only a small part of the traffic carried is the property of others, said:

"But this conclusion loses sight of the principle that the extent to which a railroad is in fact used does not determine the fact whether it is or is not a common carrier. It is the right of the public to use the road's facilities and to demand service of it rather than the extent of its business which is the real criterion determinative of its character." Then the Supreme Court added that these (lumber) roads are common carriers when tried by the test of organization for that purpose under competent legislation of the state.

The commission says it shall expect the trunk line roads to re-establish allowances, divisions or demurrage or per diem arrangements with industrial roads "only in instances in which the transaction is bona fide, and in which it is clearly lawful and proper."

It will be recalled that different state railroad commissions, such as those of Pennsylvania, New York, Ohio, Illinois and Indiana, shortly after the original decision by the federal commission, passed upon the rights of steel lines and handed down opinions contrary in all cases to those of the latter body. This action is taken to have encouraged the steel plant lines and companies to seek an order in the Interstate Commerce Commission's original decision. A writ of mandamus was sought by Steel Corporation lines and industries they serve including and in addition to their own, to compel the commission to enter an order. The Supreme Court of the District of Columbia, to which application for the writ was made, refused to issue the order, but not until assurance had been given the petitioners that the commission would act further.

In his dissenting opinion, Chairman Harlan says the majority report, while modifying the original decision, establishes no rule for the future guidance either of the carriers, or of the industries, or of the commission with respect to any of the questions involved in the case. It is pointed out by him that the majority report "does not discuss the question of free services or any of the important matters growing out of demurrage and reclaims; it does not consider whether any distinction is to be made between the tracks of an industrial road that lie outside the plant and those that are wholly enclosed by the plant; nor does it announce any principle by which either the line carrier or anyone else may determine which of the industrial lines mentioned in the report are to be regarded as performing a service of transportation as a common carrier."

"The supplemental report," he says at another point, "states that each of these industrial lines must be judged by its own facts and merits, and that each is or is not a common carrier, but the duty of so judging is left unperformed, although all the facts in each case are fully before us. I do not find such an announcement helpful or enlightening, and I do not see how it can be to others who must act under the supplemental report in one way or another. As a matter of fact in the case last sighted (tap line), the Supreme Court drew a very clear distinction between tap lines and industrial lines of the character described here of record and which we held in the original report to be plant facilities."

Harlan's Comment

Mr. Harlan quotes the Supreme Court in the General Electric Co. and Solvay Process Co. cases, wherein it is said "these systems of internal trackage were not common carriers, and, however extensive, were intended to and did furnish service for the plants which owned and operated them."

Then Mr. Harlan makes this comment:

"I venture to express the conviction that the failure of the commission to comply with the requests for an order that have lately been made, thus giving the courts an opportunity to review these questions upon a very broad record involving many industrial railways operating under a great variety of conditions, so far from expediting a sound and satisfactory final basis for our course in the future, will leave these important questions unsettled and in great confusion."

He closes by referring to the commodities clause.

"While I do not propose to enter upon any discussion here as to our power to enforce the commodities clause," he says, "I do assert that we ought not by any affirmative action to sanction, as is here done, rates or practices that are in violation of it."

Steel plant lines which had taken action out of which grew the supplemental report included the Union railroad, Newburgh & South Shore, Lake Terminal, Elwood, Anderson & La Pelle, Benwood & Wheeling Connecting, McKeesport Connecting, Etna & Montrose, Lucy Furnaces railroad, Pittsburgh & Ohio Valley, St. Clair Terminal, and Pencoyd & Philadelphia, Steel Corporation roads; South Buffalo railroad, Lackawanna Steel Co.; Monongahela Connecting, Jones & Laughlin Steel Co.; Baltimore & Sparrows Point, Maryland Steel Co.; Philadelphia, Bethlehem & New England, Bethlehem Steel Co., and Pittsburgh, Allegheny & McKees Rocks, Pressed Steel Car Co.

Reduced Rates

Across Continent as Related to Those of Intermediate Points

Detroit, Nov. 10.—Michigan's position in reference to transcontinental freight traffic is jeopardized by the efforts of through lines to get reduced through rates at the expense of intermediate points.

"Intermediate rates are now too high between Detroit and the Pacific coast," declared Arthur T. Waterfall, traffic commissioner of the Detroit Board of Commerce. Mr. Waterfall will represent Detroit and Michigan shippers at a hearing started before Special Examiner Henry Thurtell, of the Interstate Commerce Commission in Chicago.

"Transcontinental lines now propose to reduce rates, with the consent of the Commission, so that their rates will be practically on a par with those at which freight shipments may be made from New York to Pacific coast cities through the Panama canal," he continued.

According to Mr. Waterfall, the change proposed would affect several hundred Detroit and Michigan shippers to western points, particularly in automobile lines. It would mean that an automobile could be shipped cheaper from New York to San Francisco than from Detroit to the same point, in spite of the fact that Detroit is approximately 700 miles nearer the Pacific coast.

TIPS FOR NEW BUSINESS

Equipment needs of the Iron and Steel works, Machine shops, Foundries and other Metal Working plants

ALTHOUGH some further orders for machine tools were placed in the east last week, for the account of the belligerent countries in Europe, the rush in the foreign demand, temporarily at least, has eased off. The Bethlehem Steel Co. purchased some additional equipment and, it is reported, still is in the market. The Midvale Steel Co. is expected to be in the market shortly for a large amount of equipment of the same character as that purchased by the Bethlehem company. The E. W. Bliss Co., Brooklyn, which was alluded to in last week's issue as having purchased 40 lathes, has increased this number to 99 lathes, and this company is expected to place other large orders shortly. The Transcontinental railroad of Canada, it is learned, has decided not to issue its proposed list of machine tool specifications this year and the list likely will not be available for figuring before spring. Eastern railroads have placed orders for machinery with somewhat more liberality during the past week, but the aggregate value of the business amounts only to some $10,000. New York machinery dealers continue to report an improvement in the volume of small orders, and current business, most of them say, is of such a character as to indicate an improvement in underlying conditions. The situation, however, all feel, has a long way to go before it again reaches normal. It is interesting to note that one large machinery seller reports nearly three times as much business during the first week of this month, as during all of November, 1913, and that this month also ranks well above October. There are several inquiries in the market for cranes. The Bethlehem Steel Co. will buy several small cranes for installation at its ore mining properties at Cruz Grande, Chile. The Public Service Corporation of New Jersey, will take bids until about Dec. 15, for a 90-ton crane, to be installed at its large new power house now in course of construction near Newark, N. J. The Moody Engineering Co., 125 Broadway, New York, is getting ready to purchase a large gantry crane and complete equipment for a coal-handling plant, to be built in Porto Rico. The Brooklyn Rapid Transit Co. is in the market for some small hand-operated power house cranes.

At Pittsburgh, machine tool dealers have not yet benefited as a result of the heavy demand for equipment created by the war in continental Europe, but expressions are heard that the market will be indirectly improved when domestic buying resumes. The Alloy Steel Forging Co., now operating a plant at Braeburn, Pa., contemplates the erection of a new plant at Carnegie, for the manufacture of manganese steel forgings. Bids are being asked on power house equipment for a bank building at Steubenville, O., noted elsewhere in this issue. Unconfirmed reports are heard that the Glen Mfg. Co. plant at Ellwood City will be equipped for the manufacture of window sash, etc. Builders of heavy rolling mill equipment are operating on reduced schedules for the first time in many months.

Machine tool dealers in Chicago continue to hear of increased business from foreign sources, but domestic business continues as dull as for several weeks back. A few lathes, planers and shapers are in demand, but nothing like a concerted buying movement has developed. Manufacturers in Milwaukee and other nearby points have found their business increased materially by the demand from foreign countries, but this is not sufficient to keep them busy long unless further orders supplement those already received. A sale recently of a 1,200-pound steam hammer marked a low point in price for this class of machinery, going at less than 5 cents per pound.

In Cincinnati, orders for lathes continue to come in from foreign countries engaged in the present European war. The R. K. LeBlond Machine Tool Co. recently has closed a contract for 70 additional lathes, and although a part of the large inquiry from a cream separator manufacturer in Stockholm, Sweden, for 400 lathes, has been placed, machine tool manufacturers in this city are still figuring on the remainder of this business. The Kelley Springfield Motor Truck Co., Springfield, O., has received a large order for motor trucks for shipment to European countries, and auto truck manufacturers in this vicinity also report better business. A large number of machine tool plants in Cincinnati are running full force and some are even operating night shifts. Taken as a whole, the machine tool industry is busier at present than at any time this year. Present orders will keep business at a fairly high tide until about the first of the year. Stock lathes are being exhausted rapidly as foreign buyers are asking for immediate deliveries. The demand for planers and shapers is light, but a few heavy orders have been taken for milling machines and radial drills. Sales to users of all kinds of machine tools in this country are very light and show no improvement.

EASTERN STATES

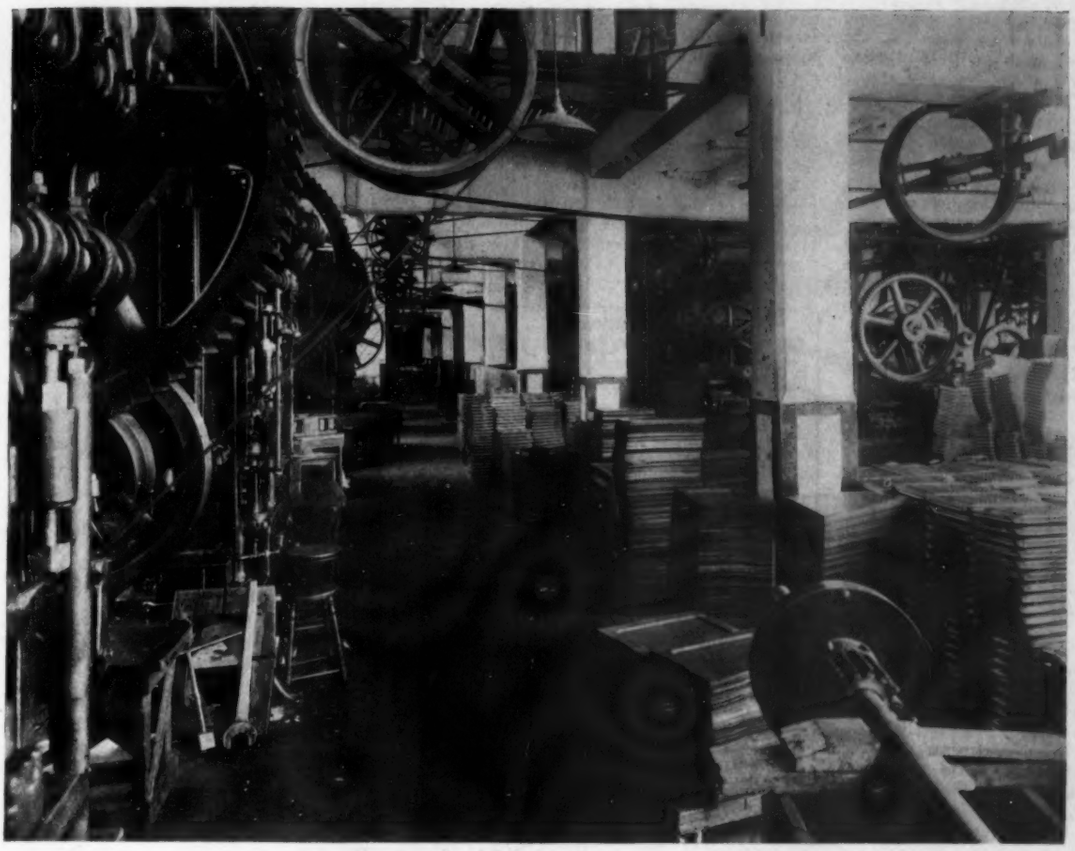
BOSTON.—Holt Shattuck Co., machinists' supplies, has been incorporated; $25,000 capital stock; by A. H. Draper, Boston; G. M. King, Hyde Park.

SALEM, MASS.—Zina Goodell has commenced construction on the buildings recently mentioned as being under contemplation; these include a machine shop, a garage and a general manufacturing building.

SOMERVILLE, MASS.—W. W. Crosby, Jr. has purchased 19,000 square feet at foot of Earl street and will erect large factory.

WORCESTER, MASS.—Outlook Mfg. Co., machinery, has been incorporated; $25,000 capital stock; by Frederick E. Arrouquier, James J. Cavanaugh, William Arter, et al.

WORCESTER, MASS.—In addition to two



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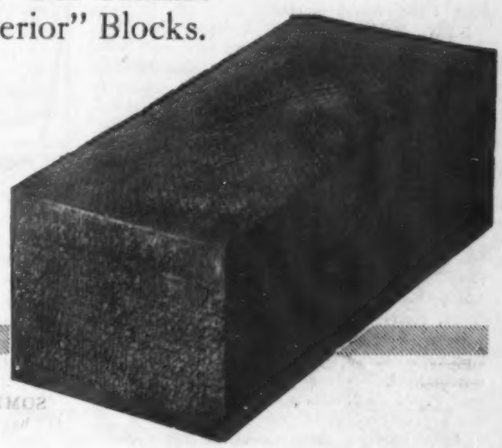
Every business depression the United States has passed through has been followed by a period of big business. Are you equipped to care for the big business when it comes? You have some men you want to keep on while business is slack. Make them earn their salt. You can repair more cheaply now than later. Why not make use of your good men and get your floors in good shape for the big business that is coming. Our booklet "FLOORS" tells what we claim for "Interior" Blocks. We can prove every word of it.



Ayer & Lord Tie Company

General Office: Railway Exchange, Chicago

CLEVELAND, O.—801 Swetland Bldg. ST. LOUIS, MO.—554 Pierce Bldg.
KANSAS CITY, MO.—1117 Rialto Bldg. MEMPHIS, TENN.—1402 Exchange Bldg.
PHILADELPHIA, PA.—319 Perry Bldg.

three-story brick additions now under construction at plant of Spencer Wire Co., the company has started work on a third addition; this will be 69 x 230 feet, two stories and basement.

BRIDGEPORT, CONN.—Remington Arms-Union Metallic Cartridge Co. is breaking ground for a large factory building, 600 feet long and which is expected to be five stories high; this is in addition to the one-story extension now in process of construction.

ALBANY, N. Y.—Albany Norwalk Vault Co., of Colonie, has been incorporated to make steel forms for concrete work, burial vaults, etc.; $2,000 capital stock; by Frank A. Sherer, 282 Morton avenue, Albany; Charles A. and Clara B. Straw, Drums, Pa.

BROOKLYN, N. Y. — Brooklyn Rapid Transit Co. is in the market for several hand-operated cranes of small capacity.

BROOKLYN.—Independent Wet Wash Co. will erect a $25,000, four-story, brick factory at 351-353 Herzel street.

BROOKLYN, N. Y.—Plant of Royal Iron Works, 556 Flushing avenue, was slightly damaged by fire.

BUFFALO.—Empire Concrete Shingle Co. has been incorporated; $100,000 capital stock; by F. and A. C. Lipp, W. H. Snyder.

BUFFALO, N. Y.—Motor Cycle Car Corporation has received its charter; $10,000 capital stock; C. M. Babbitt, E. W. and A. E. Bennett, Grand Island, incorporators.

CHEEKTOWAGA, N. Y. — Cheektowaga Construction Corporation has received its charter; $10,000 capital stock; W. F. Wieberg, Michael Batterman, Bernard Fossett, 991 Walden avenue, Buffalo, incorporators.

GLOVERVILLE, N. Y.—Normandie Silk Mills have increased their capital from $30,000 to $50,000.

GREAT NECK, N. Y.—Modern Fasteners Corporation, machinery, tools, etc., has received its charter; $30,000 capital stock; C. G. Campbell, S. Newton, New York; W. R. Baird, South Orange, N. J.; incorporators.

HUDSON FALLS, N. Y.—Union Bag & Paper Co. is considering the erection of a two-story, machine paper mill in Fenimore to adjoin the present plant.

NEW YORK.—Combined Fire Extinguisher & Fire Alarm Co. has been incorporated; $5,000 capital stock; by C. Caselli, S. Guglielmo, Andrea Basile, 812 Kent avenue, Brooklyn.

NEW YORK—Auto & Machine Springs Co. has been incorporated; $10,000 capital stock; by M. Kleinburg, E. and I. Bramson, 106 East Eleventh street.

NEW YORK.—Progressive Knitting Works have been incorporated; $10,000 capital stock; by Emil Tucker, Jacob and Benjamin Moss, 148 New Jersey avenue, Brooklyn.

NEW YORK.—Vulcan Metals Co. has been incorporated; $200,000 capital stock; by H. Lowe, W. B. Brick, Eugene Van Schaick, 30 East Forty-second street.

NEW YORK.—Carden Process Co., machinery appliances, has been incorporated; $250,000 capital stock; by F. M. Nestler, Oma Carr, E. W. Deming, 828 St. Nicholas avenue.

NEW YORK.—Globe Steel Products Co., ball bearings, auto parts has been incorporated; $5,000 capital stock; by M. Vieweger, J. R. Quinn, C. F. Sultmeyer, 50 Church street.

NEW YORK, N. Y.—Moody Engineering Co., 115 Broadway, is taking bids for complete equipment for coal handling plant in Porto Rico; it will include a large gantry crane, conveyer apparatus, etc.

NEW YORK.—W. P. Seaver, Inc., bridges, structural work, steel plates, has received its charter; $10,000 capital stock; Carl Hartzelius, F. A. Gill, Harry Gillen, White Plains, N. Y.; incorporators.

NEW YORK.—Otto F. Schuster, Inc., tools, machinery, orthopedic appliances, has been incorporated; $5,000 capital stock; by E. Johnson, R. H. and O. F. Schuster, 23 Union Park avenue Jamaica, N. Y.

ROCHESTER, N. Y.—Rochester Monitor Co., machine shop foundry, has been incorporated; $30,000 capital stock; by S. A. Thomas, B. D. Straight, J. S. Avery.

ROCHESTER, N. Y.—Charles M. Everset, president of the Vacuum Oil Co., says that work will start at once on the company's $125,000 addition to its refining plant in Olean.

SYRACUSE, N. Y.—Lefever Arms Co. has had plans prepared by Taber & Baxter, for one-story, 38 x 70 feet, brick addition.

SYRACUSE, N. Y.—R. S. Hoffman's paper mill, Baldwinsville, N. Y., which was badly damaged by fire, will probably be rebuilt.

UTICA, N. Y.—New York Central railroad will erect a frame boiler house; cost about $2,000.

ALTOONA, PA.—Reported the Pennsylvania railroad will erect an additional heat treating plant at the Juniata shops shortly.

ELWOOD CITY, PA. — Unconfirmed reports that Pittsburgh capital interested in old Glen Mfg. Co. plant for manufacture of window sash, etc; plant equipped for manufacture fire escapes, wire fence and wire novelties; W. J. McKim, Elwood City, in charge of plant, now idle.

ERIE, PA.—Municipal water commissioners have started plans for the construction of a 100,000,000-gallon storage and supply reservoir, to be constructed of reinforced concrete, and about 20 miles of pipe of various sizes; work is to be completed before next summer.

ERIE, PA.—Maxicon Products Co., being the Ferro-Krete Co. whose plant was damaged by fire in Meadville recently, has taken a plant in Erie and is installing machinery; company manufactures a concrete hardener using carload lots of iron and steel filings. Capital stock is $450,000, of which $50,000 is being issued.

GREENVILLE, PA.—Greenville Steel Car Co. has begun work on addition, 440 x 90 feet, to plant.

LANCASTER, PA. — Excelsior Plating Works was badly damaged by fire; loss about $6,000.

MILTON, PA.—Milton Brick Co. will erect a $35,000 addition.

NEW CASTLE, PA.—Canton Bridge Co., Canton, O., was awarded contract for bridge over Connequenessing creek; $108,000; Thomas A. Gilkey, New York, engineer.

PHILADELPHIA. — Household Mfg. Co., E. T. Freeman, manager, Hudson Terminal building, New York, will erect a three-story brick factory at Thirty-second street and Powelton avenue.

PITTSBURGH.—H. O. Morgan will erect a six-story factory building at 713 Forbes street.

PITTSBURGH.—Thomas Reilly, Pittsburgh and New York, low bidder on new Schenley high school building; $681,226; Indiana limestone; 1,300 tons of steel will be involved.

PITTSBURGH.—Western Theological Seminary, North Side, has awarded J. E. and A. L. Pennock, Philadelphia, contract for two and one-half story building; $200,000; Thomas Hannah, Pittsburgh, architect.

PITTSBURGH.—S. H. Heckert, Bessemer building, asking separate bids on foundation work, structural steel, etc., for proposed $150,000 New Kensington general hospital, New Kensington, Pa.

PITTSBURGH—Auto Metal Body Works have been incorporated; $6,000 capital stock; by Edward A. Schootle, Louis T. Vremsak, Rudolph Roitz, Anthony Gould, Pittsburgh; Charles Weggman, Wilkinsburg.

PITTSBURGH.—Alloy Steel Forging Co., W. S. Potter president, contemplates new plant at Carnegie, Pa., for manufacture of manganese steel forgings; equipment at present plant at Braeburn, Pa., will be moved and additional machinery will be installed; contract for building not let.

SCRANTON, PA. — Board of trade will erect a building to cost about $60,000 for the Motor Cart Co., Peaksville, N. Y.

SOUTH BETHLEHEM, PA.—Bethlehem Steel Co. will purchase several small cranes for export to its ore mines at Cruz Grande, Chile.

SOUTH BETHLEHEM, PA.—Bethlehem Steel Co. will add a fuse plant, 60 x 200 feet, with two wings, each 60 x 120 feet; machinery will be electrically driven.

SOUTH BROWNSVILLE, PA.—City will build two-story high school; $70,000; A. P. Cooper, architect, Uniontown, Pa., has plans.

GLOUCESTER, N. J.—R. J. Rolston, manager, Welsbach Gas Lamp Co., says the company proposes to enlarge its factory.

Mr. On-the-Job Attention!

Here's the cream of the week's best business news. Skim it.

The board of education, Jersey City, N. J., has issued a list of specifications for tools, including 21 lathes, two millers, a planer, a universal grinder, wet tool grinder, shaper, upright drill, and sensitive drill, power hack saws, tempering equipment and miscellaneous small tools.

Tindel-Morris Co. will make enlargements, to cost at least $100,000, at its plant in Eddystone, Pa. Improvements provide for the manufacture of steel gas containers and for the installation of special machinery for the manufacture of war materials such as steel shrapnel cases, etc.

Public Service Corporation of New Jersey, Newark, N. J., will receive bids until Dec. 15 on a 90-ton crane and other equipment for a larger power house now under construction in Newark.

Bethlehem Steel Co., South Bethlehem, Pa., will purchase several small cranes for export to its ore mines in Cruz Grande, Chile.

Moody Engineering Co., 115 Broadway, New York, is taking bids for complete equipment for a coal handling plant in Porto Rico; it will include a large gantry crane, conveyer apparatus, etc.

Brooklyn Rapid Transit Co., Brooklyn, is in the market for several hand-operated cranes of small capacity.

Alloy Steel Forging Co., W. S. Potter, president, contemplates a plant at Carnegie, Pa., for the manufacture of manganese steel forgings. The equipment at the present plant at Braeburn, Pa., will be moved and additional machinery installed. The contract for building has not been let.

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While others are hopelessly struggling for *quality,* here is *your* opportunity to obtain it without effort.

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Its *closeness of grain* and ability to take a *high polish,* make it most highly desirable in the making of cylinders of all kinds, automobile cylinders included.

Although "Thomas-Vanadium" is exceedingly strong, it is soft enough to be easily threaded and machined.

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Following is the result of a test of our No. 2 Plain "Thomas-Vanadium", made by Prof. Edwin O. Fitch, Jr., of Lafayette College.

The PIG was made from a mixture of 66⅔ per cent Richard Ore and 33⅓ per cent local ores.

The charge to the cupola consisted of 630 lbs. of pig and 350 lbs. of coke. No flux was used.

	In pig	In castings
Silicon	1.93	1.881
Sulphur	0.026	0.044
Phosphorous	0.84	0.844
Ti	0.190	0.148
Vanadium	0.043	0.040
Carbon	3.41	3.42

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Philadelphia: 628 Stephen Girard Building

New York: 90 West Street **Boston: Exchange Bldg., 53 State Street**

NEWARK, N. J.—Lister Agricultural Chemical Co., has been granted permit for erection of brick storage and grinding shop to replace that recently destroyed by fire.

NEWARK, N. J.—Aluminum Plated Ware Co. has been incorporated to make plated aluminum; $100,000 capital stock; by H. Charles Stone, Philadelphia, James H. Opp, Newark, Edward E. Sturges, New York.

NEWARK, N. J.—Public Service Corporation of New Jersey is taking bids till Dec. 15 on 90 ton-crane and other equipment for a large power plant now under construction near here.

PASSAIC, N. J.—Gera Mills, textiles, have been incorporated; $175,000 capital stock; by Christian Bahnsen, Otta Bruckner, Henry Haltmann.

PATERSON, N. J.—Sipp Machine Co. is contemplating a two-story addition.

BALTIMORE.—F. M. Mackin & Co. will construct a $3,000, 45 x 75.6-foot foundry and machine shop; S. P. Ward, contractor.

BALTIMORE, MD.—Plans have been completed for the Atlantic Fertilizer Co.'s 157 x 238-foot addition at Curtis Bay; building will be of either reinforced concrete, frame or corrugated iron and will cost about $100,000.

FROSTBURG, MD. — Frostburg Electric Light Co. will enlarge its plant in view of supplying light and power to Westernport and Midland.

CENTRAL STATES

AKRON, O.—Star Rubber Co. has increased its capital from $1,000 to $200,000.

BARBERTON, O.—George Fenton is organizing the company to make brick, tile and building blocks; it will be capitalized at $50,000.

BEREA, O.—Berea Pipe Line Co. changes location to St. Marys, O., and increases its capital from $25,000 to $80,000.

CLEVELAND. — A $5,000,000 high level bridge bond issue was ratified by the voters.

CLEVELAND.—Brennan Steel Castings Co. has increased its capital from $10,000 to $60,000.

CLEVELAND. — Haltnorth Co. plans a theater and business building at East Fifty-Fifth street and Woodland avenue, to cost more than $50,000.

CLEVELAND.—Cleveland Welding & Mfg. Co. will erect a $10,000, 75 x 150-foot, concrete factory addition; no new equipment will be needed.

EAST LIVERPOOL, O.—J. P. Kelly city engineer, has plans for municipal building, for which city has agreed to bond issue; preliminary cost, $150,000.

FINDLAY, O.—Business Mens association has negotiated a contract with the Toledo Ford Tire Co. to establish its plant in Findlay; capital of company will be $300,000.

MANSFIELD, O.—Flexible Side Car Co. changes its location to Loudonville, O.

MARIETTA, O.—W. B. Alexander, county auditor, will open bids Dec. 1 for erecting the run bridge, Lawrence township, and the Chuffy bridge in Waterford township; certified check 5 per cent required.

MASSILLON, O.—F. J. Kron, superintendent of the Pennsylvania railroad, west of Pittsburgh, says that the company will reconstruct the old round-house here, which recently collapsed.

PORTSMOUTH, O.—Dravo Contracting Co., Pittsburgh, has begun work on piers for Chesepeake-Ohio Northern railroad bridge over Ohio river at Sciotoville.

SEBRING, O.—Sebring Pottery Co., maker, has been incorporated; $10,000 capital stock; by F. A. Sebring, C. L. Sebring, E. L. Sebring, E. S. Albright, E. S. Norris.

STEUBENVILLE, O.—Union Savings Bank taking power plant bids on 10-story bank and office building under construction; A. H. Northrop, Oakland avenue, Pittsburgh, superintendent in charge.

ST. HENRY, O.—Council has decided to erect a municipal light plant to run inconnection with the waterworks.

YOUNGSTOWN, O.—American Tar Products Co., Chicago, was granted permit to build plant here for manufacture of pitch and oils; five buildings contemplated, including a $3,400 still and boiler house; $6,500 condenser house; saturation building and warehouse; pulverizing building, and office building. H. Koppers Co., Chicago, has charge.

BRIDGEPORT, W. VA.—C. A. Osborne, engineer, has plans for proposed $40,000 water works system.

CLARKSBURG, W. VA.—Clarksburg Glass Co. was badly damaged by fire; loss about $40,000; plant will be rebuilt at once.

MORGANTOWN, W. VA.—J. S. Lakin, president state board of control, Charleston, W. Va., will receive bids until Nov. 21 on new building for school of medicine at West Virginia University; plans and specifications at office of board.

PRINCETON, W. VA.—Mercer county commissioners will build three bridges over Bluestone river; W. I. Lee, engineer.

WHEELING, W. VA.—Semet-Solvay Co. is planning improvements to coke plant here; large smoke stacks will be rebuilt at power house.

ASHLAND, KY.—Pond Run & Gravel Co. will purchase a 50-horsepower gasoline engine, conveyors, elevator and other equipment for a sand-handling plant.

COVINGTON, KY.—City may issue $200,000 bonds for building a pumping station and laying down additional mains; address mayor.

COVINGTON, KY.—Bond issue for a water system has been authorized by the voters; definite plans will be arranged for immediately.

FRANKLIN, KY.—Franklin Electric Light & Ice Co. will be in the market shortly for a 100-horsepower boiler; M E. Johnson, manager.

GLASGOW, KY.—Logan Pedigo's machine shop was burned with a loss of $5,000; decision regarding rebuilding has not been made.

GRAYSON, KY.—J. A. Bagby, who operates an electric light plant, will install equipment for icemaking; capacity 5 tons per day.

IRVINE, KY.—C. R. Flynn has purchased an electric light plant and will spend $5,000 in the construction and equipment of a plant.

LA GRANGE, KY.—City officials are considering proposals of Thomas R. Pullens, St. Louis, relative to establishing an iron and steel works in La Grange; concern is said to be capitalized at $100,000.

LEXINGTON, KY.—W. T. Sistrunk & Co. will erect a cold storage plant; capacity 20,000 square feet.

LOUISVILLE, KY.—Kentucky Cotton Yarn Co. has been organized with W. C. Nones, president; a mill will be leased and equipped at once.

LOUISVILLE, KY.—Schoppenhorst Dry Cleaning & Dyeing Co., will build a power plant and will need a boiler, engine generator, etc.; address F. W. Schoppenhorst.

NEW PORT, KY.—George Keller will be in the market shortly for power and conveying equipment for an addition to a grain elevator.

LOUISVILLE, KY.—Brinton B. Davis has plans for a hotel at Danville, Ky., which will require high pressure boilers, and two elevators.

LOUISVILLE, KY. — Kentucky Revivo Battery Co. plans to erect a plant to manufacture a patented electrical device; address Harry W. Embry.

LOUISVILLE, KY.—Beecher-Fowler Mfg. Co., which has recently taken over the Arthur Jones Foundry Co., will purchase a milling machine, lathe and power saw; it manufactures brass and other metal goods.

LOUISVILLE, KY. — Kentucky Rivers Battery Co., has been incorporated with a capital stock of $200,000, no new equipment will be needed at present.

MIDDLESBORO, KY.—Low Ash Mining Co. is in the market for electrically operated cutting and hauling machinery.

NEW HAVEN, KY.—Town will vote on $4,500 bonds for the erection of an electric light plant.

PADUCAH, KY.—Paducah Clay Products will equip a plant for mining clay; capacity 60 tons per day.

PADUCAH, KY.—J. W. Little will increase the capacity of his spoke mill for the manufacture of farm wagons.

SEBREE, KY.—Plans are being drawn for a $9,000 municipal water plant; address mayor.

WINCHESTER, KY. — Broadhead - Garrett Lumber Co. plans to erect a large sawmill in eastern Kentucky, where it has recently purchased 2,800 acres of hardwood timber.

CHURUBUSCO, IND.—Churubusco Telephone Co. has been incorporated; $25,000 capital stock; by Henry W. Soest, Albert Bush, Robert R. Scott, et al.

EVANSVILLE, IND.—Sweet Adding Listing Machine Co., machine making, has been incorporated; $500,000 capital stock; by William J. Rogers, Marion S. Whitley, William S. Titus.

HAMMOND, IND. — Hammond Malleable Iron Co. has been incorporated; $75,000 capital stock; by Henry J. Wanner, Harry C. Wanner, Ruth H. Wanner, all of Chicago.

INDIANAPOLIS, IND. — Guernsey Clay Co., clay products, has been incorporated; $25,000 capital stock; by P. M. Murphy, H. K. Murphy, H. A. Fenton.

TERRE HAUTE, IND.—State normal college, W. W. Parson, president, Geo. Mac Lucas & Fitton, 1151 Lemenke Annex, Indianapolis, architects, is taking bids for a vocational educational building to include a forge shop, foundry, machine shop and other specialties, for which equipment will be required.

ARGO, ILL.—Corn Products Refining Co., S. L. Petit, purchasing agent, 218 Illinois street, Chicago, is about to erect a warehouse and factory addition to cost $100,000, reinforced concrete, seven stories, 130 x 201, seven stories, 32 x 664, five stories 32 x 48. Leonard Construction Co., 332 South Michigan avenue, Chicago, has the general contract..

CARROLLTON, ILL. — Illinois Simplex Ventilating Co. has been incorporated; $6,000 capital stock; by N. D. Vedder, G. K. Hutchens, E. Z. Vurnutt.

CHICAGO.—Great Western Screw Co., 4532 Gross avenue, will erect a one-story, brick factory.

CHICAGO.—Cement Gun Construction Co. has announced an increase in capital from $10,000 to $30,000.

CHICAGO.—High Pressure Steam Engineering Co. has been incorporated; $5,000; by Roy O. West, Percy B. Eckhart and Thos. G. Deering, 38 South Dearborn street.

CHICAGO.—Chicago Architectural Bronze Co. has been incorporated to manufacture architectural bronze brass iron, etc; $2500; by Edward Berg, Ivan Ericson and Oscar Presto, 3239 Leland avenue.

CHICAGO.—Wm. L. Klewer & Son, 64 West Randolph street, are taking bids for a department store building for Albert E. Cook, five stories, 75 x 99 feet, steel and tile, to cost $30,000.

CHICAGO.—W. H. Prilly Co., 35 South Dearborn street, has the general plans for a Y. M. C. A. training school at Fifty-Third street and Drexel Blvd., 40 x 168 feet, three stories of steel and reinforced concrete.

CHICAGO.—Neiman & Co., has been incorporated to manufacture machinery and

mechanical devices; $2,500 capital stock; by Sherman M. Booth, 105 South LaSalle street, Hattie Winkelman and Robert C. Warner.

CHICAGO.—C. E. Carson Co., 139 North Clark street, has been awarded the general contract for an armory for the Second Infantry, I. N. G., at $229,000; structure is to be of brick and steel, 185 x 236 feet, requiring about 800 tons of structural steel.

CHICAGO.—James Black Masonry & Construction Co., 212 West Washington street, has the general contract for the Lake View telephone exchange of the Chicago Telephone Co.; four stories and basement, 90 x 160 feet, structural steel columns, column bases, girders and angle irons; to cost $125,000.

DANVILLE, ILL.—Hegeler Zinc Co. has been incorporated to mine, smelt and roll zinc and zinc products; $500,000; by Richard Y. Hoffman, Paul Fischer and Don K. Jones.

HAMILTON, ILL.—Quincy & Hamilton Electric Railway Co. has been incorporated to run an electric line from Quincy to Hamilton; $525,000 capital stock; by Charles D. Warren, Edward D. Parkelee, Charles H. Petsch, Warren H. Orr, et al.

LAMKEY, ILL.—Lamkey Mfg. Co. has been incorporated to manufacture hardware advertising specialties; $2500, by L. A. Lamkey, J. Lamkey and F. S. Schooler, 1959 East Seventy-second street.

OAK PARK, ILL.—Oak Park Country Club, Norman S. Patton, Chairman, 8 South Dearborn street, Chicago, is taking bids on the general contract for a club house, of brick, steel and tile, three stories, 75 x 159 to cost about $50,000.

PEORIA, ILL. — Peoria Hydraulic Pump Co. has been incorporated; $20,000 capital stock; by Clarence W. Heyl, E. F. Crehore, O. N. Howerton.

QUINCY, ILL.—F. W. Menke Stone & Lime Co., 436 Front street, has the general contract for the Fifth Regiment Armory, brick and steel, two stories, 86 x 177 feet.

RUSHVILLE, ILL.—Rural Union Telephone Co. has been incorporated; $8,000 capital stock; by J. W. Lambert, D. S. Turner, C. L. Dewitt.

ALLEGAN, MICH.—Blood Brothers Mfg. Co., Kalamazoo, Mich., is considering the establishment of an automobile factory in Allegan.

DETROIT, MICH.—Township board at Ecorse, Mich., has decided to vote on a $30,000 bond issue, proceeds to be used to build a roller lift bridge at West Jefferson avenue; half the cost of the cost of this structure if authorized, will be paid by the Detroit United Railway Co.

GRAND RAPIDS, MICH.—Oliver Machine Co. plant was slightly damaged by fire.

LANSING, MICH.—State highway commissioner will receive bids until noon, Dec. 1, for a 130-foot, riveted pratt truss to be erected before March 1, 1915 over the Pittabawasee river, Jerome township, Midland county; certified check 5 per cent required.

SAGINAW, MICH.—Council submitted to the voters Nov. 3 two bonding propositions for municipal lighting; one is $750,000 for the construction of a plant and distribution system, and the other for $540,000 for a distribution system alone.

EAU CLAIR, WIS.—Cornell Wood Products Co. will erect a three-story addition, 68 x 265 feet of steel, brick and concrete.

EAU CLAIR, WIS.—Dells Paper Co. will erect a 24 x 39-foot brick boiler house, and will install some new boiler equipment.

GRAND RAPIDS, WIS. — Inter-State Oil Co., LaCrosse, Wis., will establish a station at Grand Rapids and is taking bids on a tank and storage house costing between $8,000 and $10,000.

MILWAUKEE, WIS.—Bids for remodeling the Zimmerman building, 384-386 East Water street, damaged by fire a year ago, are being taken by Herbst & Hufschmidt, architects, plans call for a 2,000-pound electric elevator, steel sash, a small tonnage of structural shapes and iron work.

NEENAH, WIS.—Rev. J. N. Jersild has obtained all American manufacturing rights to a new type of fire escape for large buildings, designed by a Danish inventor in Copenhagen and is planning to establish a factory in Neenah. For the present, however, he intends to have the device built on contract with structural concerns in Milwaukee or other large city in Wisconsin.

RACINE, WIS.—City will erect a $100,000 two-story, 140 x 240-foot grade school of brick and reinforced concrete, with steel trussed roof; Guilbert & Funston, architects, have plans.

TURTLE LAKE, WIS.—Steady Stream Pump Co. has been incorporated; $30,000 capital stock; by T. P. Hannegan, E. W. Scheel, R. E. Dusel Co.

WAUKESHA, WIS.—George Ward, general contractor, has started work on the Spring City Foundry Co.'s 60 x 112-foot, brick, steel and concrete addition. Previously noted.

WAUKESHA, WIS. — Waukesha Spring Water Ice Co. has been organized by local capital to establish an artificial ice plant at the Acme mineral spring in Waukesha; it is planned to have the plant in operation by April 1, 1915.

WHITEWATER, WIS. — W. C. Kierman has the general contract for a $4,248 steel and concrete grandstand for the Whitewater Normal school athletic field.

KANSAS CITY,MO.—Bulger-Keenan Horseshoeing Co. has been incorporated; $2,000 capital stock; by Miles Bulger, Charles T. Ayers, D. M. Keenan.

ST. CHARLES, MO.—St. Mary's Machine Co., maker of engines, has given the general contract to the Bellefontaine Bridge Co., Bellefontaine, O., for a factory building of steel frame, one story, 100 x 150 feet, and a foundry building, one story, 70 x 160 feet.

ST. JOSEPH, MO.—Eckel & Aldrich, 1104 Corby Forsee Building, are taking bids on a hospital building, five stories, 42 x 150 feet of reinforced concrete.

DULUTH, MINN.—Charles K. Shand is preparing plans for a powerhouse to be erected at Aurora, Minn.; estimated cost $7,000.

MINNEAPOLIS, MINN.—Lyle Corrugated Culvert Co. will erect a $10,000 addition to its plant at Twenty-seventh avenue and Delaware street.

MINNEAPOLIS.—Green Brothers, care of F. E. Halden, 601 Kasota Block, are about to erect a theater of brick and steel, three stories, 61 x 137 feet.

ST. PAUL, MINN.—Buechner & Orth, 500 Shubert building, have made plans for an arcade and office building 100 x 130 feet, three stories of brick and steel to cost about $200,000.

SOUTHERN STATES

PETERSBURG, VA. — Dupont Powder Works, City Point, is preparing to erect three buildings for the manufacture of smokeless powder.

JACKSONVILLE, FLA.—Ponce de Leon Bridge Co. has been capitalized at $30,000 to erect a toll bridge across North river from Kurth's island; board of trade is informed.

CROWLEY, LA.—Police jury of Arcadia, Parish, La., will receive at the courthouse, Crowley, until noon, Nov. 28 for two steel bridges; certified check 5 per cent required.

BEAUMONT, TEX.—Fire badly damaged the Texas New Orleans car repair shop; loss about $12,000.

EL PASO.—Perry-Kilpatrick Realty Co. will erect a frame machine shop at Magoffin avenue; estimated cost $3,000.

FREEPORT, TEXAS. — Freeport Light, Water & Ice Co. has been incorporated; $5,000 capital stock; by C. A. Jones, F. F. Hastings, W. T. Andrews.

TERRELL, TEX.—Roundhouse at the Texas Midland shops was badly damaged by fire.

BENTONVILLE, ARK.—Light & Water Systems, George A. Johnson, superintendent, are in the market for 75-kilowatt generator, etc.

LITTLE ROCK, ARK.—J. L. Rettig, president, Little Rock Lumber & Mfg. Co. says that the company has closed a contract for a site in Factoria, Ark., where a band mill with a capacity of 45,000 feet a day is to be erected.

CHATTANOOGA, TENN.—L. S. Collyer, James building, is in the market for a belt-driven air compressor.

CHATTANOOGA, TENN.—Toledo Bridge & Crane Co. has contract for erection of steel superstructure for the new Market street bridge; bid was $119,000.

DRESDEN, TENN.—Municipality will vote Nov. 27 on $27,000 bonds for waterworks and electric light purposes.

KNOXVILLE, TENN.—Knoxville Lumber & Mfg. Co. has purchased a site for a factory and will start on its erection at once; address President, Eugene Galyon.

NASHVILLE, TENN.—Jellico Foundry Co. of Campbell county has been incorporated; $10,000 capital stock; by P. L. Johnson, J. T. Moore, G. A. Russell, W. G. Smith, John E. Brown.

NEWPORT, TENN.—Municipality will expend $5,000, the proceeds of a bond issue, for improving water works system.

PRYOR, OKLA.—City Light & Ice Co. has been incorporated; $50,000 capital stock; by J. R. Culliane, St. Louis, Mo.; W. J. O'Brien, Durant, Okla., G. C. Kissel, Pryor.

WESTERN STATES

GERALDINE, MONT.—W. L. Kemper, Great Falls, Mont., has started on the foundation for the electric light and power plant.

BOISE, IDA.—U. S. Reclamation Service will receive bids until Nov. 22 for gate hoisting equipment for sluice gates in connection with the Jackson enlarged project at Moran, Wyoming.

MOUNT VERNON, WASH.—Department of Indian affairs has approved application of county commissions for opening a road through Swinomish reservation, including construction of a steel bridge across Swinomish slough.

SEATTLE, WASH.—Ditlefsen & Gerring, Leary building, who have the contract for constructing the 10-story hotel to be erected by the Rainer & Power Co., are receiving bids for structural steel, etc.

GRANTS PASS, ORE.—Moon Williams Lumber Co. is seeking a site for a sawmill near here.

OREGON CITY, ORE.—City will open bids Nov. 21 for a steel or wood pipe pressure main in its water supply system.

HEROULT-ON-THE-PIT, CAL. — Charles G. Carter, reported to represent Boston capital, has secured options on land and plans include a plant of three units for producing calcium nitrates; first unit, costing about $300,000, is expected to be started soon.

LOS ANGELES, CAL.—Axelson Machine Co. has purchased a five-acre site in Vernon, Cal., on which it expects to erect a factory shortly.

LOS ANGELES, CAL. — Pressed Steel Wheel Co. has been incorporated; $100,000 capital stock; by H. T. Payne, J. S. Johnston, G. Bennington, T. E. Stanton, C. W. Hubbard.

RICHMOND, CAL.—Giant Valve & Mfg. Co. has started on its first building, 140 x 200 feet; it plans several structures.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(Delivery This Year.)

Bessemer, valley	$13.75 to 14.00
Bessemer, Pittsburgh	14.70 to 14.95
Basic, Pittsburgh	13.45 to 13.60
Basic, eastern Pa.	14.00
Malleable, Pittsburgh	13.70 to 13.95
Malleable, Chicago	13.00 to 13.50
Malleable, Philadelphia	14.50 to 15.00
Malleable, Buffalo	12.00 to 12.50
No. 1X Philadelphia	14.75 to 15.00
No. 2 foundry, Pittsburgh	13.70 to 13.95
No. 2 foundry, Cleveland	13.50 to 13.75
No. 2 foundry, Ironton	13.00
No. 2 foundry, Chicago	13.00 to 13.50
No. 2X foundry, Philadelphia	14.50 to 14.75
No. 2X fdy., (N. J. tidewater)	14.00 to 14.25
No. 2X foundry, Buffalo	12.00 to 12.50
No. 2 plain, Philadelphia	14.25 to 14.50
No. 2 plain, (N. J. tidewater)	13.75 to 14.00
No. 2 plain, Buffalo	12.00 to 12.25
No. 2 southern, Birmingham	10.00
No. 2 southern, Cincinnati	12.90
No. 2 southern, Chicago	14.00 to 14.25
No. 2 southern, Phila. delivery	14.50
No. 2 southern, Cleveland	14.00
No. 2 south'n, New York, docks	14.25 to 14.50
No. 2 southern Boston, docks	14.25 to 14.50
No. 2 south'n interior New Eng.	15.00 to 16.00
No. 2 southern, St. Louis	14.00 to 14.25
Virginia No. 2X furnace	12.25 to 12.75
Virginia 2X, Philadelphia	15.00 to 15.25
Virginia, 2X, Jersey City	15.25 to 15.50
Virginia, 2X, New Eng. interior	16.00 to 16.25
Gray forge, (eastern Pa.)	13.50 to 13.75
Gray forge, Pittsburgh	13.45 to 13.70
Gray forge, Birmingham	9.00 to 9.50
Silveries, 8 per cent, Cleveland	17.63
Silveries, 5 per cent Birmingh'm	12.50
Silveries, 5 per cent, Chicago	16.35
Standard low phos., Phil.	20.50 to 21.00
Lebanon low phos., furnace	16.00 to 16.50
Low phos., Pittsburgh	20.95 to 21.20
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	15.75 to 16.50
Charcoal, Buffalo	15.75 to 16.75
Charcoal, Birmingham	25.00

IRON ORE

(Lower lake ports.)

Old range Bessemer, 55 per cent	$3.75
Mesabi Bessemer, 55 per cent	3.50
Old range, non-Bess., 51½ per cent	3.00
Mesabi non-Bessemer, 51½ per cent	2.85

(Per unit Philadelphia.)

Foreign Bess., 50 to 65 per cent	7c
Foreign non-Bess., 50 to 65 per cent	7c

COKE

(At the ovens.)

Connellsville furnace	$1.60 to 1.75
Connellsville fur. contr.	1.65 to 1.75
Connellsville foundry	2.15 to 2.40
Connellsville fdy., contr.	2.25 to 2.50
Wise county furnace	1.75 to 2.00
Wise county foundry	2.10 to 2.40
Pocahontas furnace	1.75 to 2.00
Pocahontas foundry	2.00 to 2.25
New River, foundry	2.50 to 3.00
New River, furnace	2.00 to 2.25

FERRO-ALLOYS

Ferro-manganese, Baltimore	$67.50 to 68.00
Ferro-silicon, 50 per cent, Pbgh.	71.00 to 73.00
Ferro-silicon, 50 per cent, Phila.	71.00 to 73.00
Ferro-sil., 12 to 13 per cent, Pgh.	22.90
Ferro-sil., 11 to 12 per cent, Pgh.	21.90
Ferro-sil., 10 to 11 per cent, Pgh.	20.90
Ferro-sil., 9 to 10 per cent, Pgh.	19.90
Ferro-carbon titanium, carloads, per lb.	8c to 12½c

SEMI-FINISHED STEEL

Open-hearth billets, Phila.	$21.40 to 21.90
Forging billets, Phila.	24.40 to 25.40
Forging billets, Pbgh. (nom.)	25.00
Wire rods, Pittsburgh	$26.00
Billets, Pbgh. and Ygnst.	$19.00 to 19.50
Sheet bars, Pbgh. and Ygnst.	19.50 to 20.50

RAILS AND TRACK MATERIAL

Stand. Bess., rails, Pbgh.	1.25c
Stand. open-hearth rails, Pbgh.	1.34c
Light rails, 8 lbs., Pbgh. or Chi.	1.275
Lgt. rails, 12 lbs., Pbgh. or Chgo.	1.225
Lgt. rails, 16 to 20 lb., Pbgh. or Chicago	1.175
Lgt. rails, 25 to 45 lbs., Pbgh. or Chicago	1.125
Relaying rails, standard, Chgo.	$23.00 to 24.00
Relaying rails, light, Chicago	21.50 to 22.50
Angle bars, st. sect. Pbgh. base	1.50c
Angle bars, st. sections, Chgo.	1.50c
Spikes, railroad, Pbgh.	1.40c to 1.45c
Spikes, railroad, Chgo.	1.55c
Track bolts, Pbgh.	2.00c
Track bolts, Chgo.	2.00c

SHAPES, PLATES AND BARS

Structural shapes, Pittsburgh	1.10c to 1.15c
Structural shapes, Chicago	1.25c to 1.34c
Structural shapes, Philadelphia	1.30c to 1.35c
Structural shapes, New York	1.31c to 1.36c

Freight Rates via Panama Canal

Rates on finished materials, including plates, shapes, bars, wire, nails, etc., to Pacific coast points via Panama Canal, per 100 lbs., in carload lots, exclusive of insurance and dockage.

From New York	$0.25
From Pittsburgh	.41
From Youngstown	.43
From Niles	.43
From Wheeling	.41
From Steubenville	.41
From Johnstown	.395
From Coatesville	.34
From Steelton	.35
From Bethlehem	.325
From Cleveland	.44
From Chicago	.55

Structural shapes, San Francisco	2.00c to 2.05c
Tank plates, Chicago	1.25c to 1.34c
Tank plates, Pittsburgh	1.10c to 1.20c
Tank plates, Philadelphia	1.30c to 1.35c
Tank plates, New York	1.31c to 1.36c
Bars, soft steel, Pittsburgh	1.10c to 1.15c
Bars, soft steel, Chicago	1.25c to 1.34c
Bars, soft steel, Philadelphia	1.30c to 1.35c
Bars, soft steel, New York	1.31c to 1.36c
Hoops, carloads, Pittsburgh	1.25c
Hoops, less carloads, Pittsburgh	1.30c to 1.35c
Bands, Pittsburgh	1.10c to 1.15c
Shafting, carloads, Pbgh., disc. contract	66 to 67
Shaft'g less carl'ds, Pbgh., disc.	63
Bar iron, Chicago	1.00c to 1.05c
Bar iron, Philadelphia	1.17c to 1.22c
Bar iron, New York	1.15c to 1.20c
Bar iron, Cleveland	1.20c
Bar iron, Pittsburgh	1.20c
Hard steel bars, Chicago	1.25c to 1.30c
Smooth finish. mchy. steel, Chi.	1.68c

SHEETS AND TIN PLATE

No. 28, black, Pittsburgh	1.90c to 2.00c
No. 28, black, Chicago	1.99c to 2.09c
No. 28, tin mill, black, Pbgh.	1.95c
No. 28, galvanized, Pbgh.	2.85c to 3.00c
No. 28, galvanized, Chgo.	2.99c to 3.09c
No. 10, blue, annealed, Pbgh.	1.40c to 1.45c
No. 10, blue, annealed, Phila.	1.60c
Tin plate, 100 lb., coke, base	$3.15 to 3.40

EXTRAS FOR SHEET OR TIN MILL SPECIFICATIONS

(Per hundred pounds.)

Single pickled, cold roll., and re-an.	30 cents
Hot roll'd, pickl'd and ann., tin mill	25 cents
Full pickled, cold rolled and re-ann.	50 cents
Auto sheets	75 cents
Blued stove pipe stock	10 cents
Range steel	30 cents
Re-squaring	10 cents
Roller levelling	10 cents
Patent levelling and re-squaring	35 cents
Oiling sheets	10 cents
Deoxidizing	10 cents
Lime finish	10 cents
Open hearth steamping steel, free from mill scale	55 cents
Special open hearth deep stpg. steel free from mill scale	80 cents

Extra deep special auto body stock $1.25

Ext. for 28 gage ov. 32 to 36-in. wide 10 cents
No reduction for sheets not annealed

The above extras apply on both sheet and tin mill specifications, at the same rate.

IRON AND STEEL PIPE

(Pittsburgh.)

	Black Butt-weld.	Galv.
Steel, ⅜ to 3 inches	81	72½
Iron, ⅜ to 2½ inches	70	61
	Lap-weld.	
Stele, 2½ to 6 inches	80	71½

BOILER TUBES

Steel, 3½ to 4½ inches	73
Iron, 3½ to 4½ inches	60

WIRE PRODUCTS

Wire nails, jobbers, Pittsburgh	$1.60
Wire nails, retailers, Pittsburgh	1.65
Plain wire, jobbers, Pittsburgh	1.40
Plain wire, retailers, Pittsburgh	1.45
Galvanized wire, jobbers, Pbgh.	1.80
Galvanized wire, retailers, Pbgh.	1.85
Polished staples, Pbgh.	1.60
Galvanized staples, Pbgh.	2.00
Barb wire, painted, jobbers, Pbgh.	1.60
Barb wire, painted, retail'rs, Pbgh.	1.65
Barb wire, galv., retail's, Pbgh.	2.05
Barb wire, galv., jobbers, Pbgh.	2.00

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller or shorter, rolled threads, 80 and 20; cut threads 80 and 15; larger or longer, 75 and 15.

Machine bolts with hot pressed nuts ⅜ x 4 inches, smaller or shorter, rolled, 80 and 25; cut, 80 and 20; larger or longer, 80.

Gimlet and cone point lag or coach screws, 80 and 25.

Hot pressed square, blank or tapped nuts, $6.30 off list; hot pressed hexagon blank or tapped, $7.20 off.

Cold pressed, c. and t. square, blank or tapped, $6 off; hexagon, blank or tapped, ⅜ inch and larger, $7.20; ⅜-inch and smaller, $7.80.

RIVETS

Structural rivets, Pbgh.	1.45c to 1.50c
Structural rivets, Chgo.	1.68c
Boiler rivets, Pbgh.	1.55c to 1.60c
Boiler rivets, Chgo.	1.78c

SCREWS

(New York.)

Lag, gimlet and cone point	80 and 20
Coach, gimlet point	80
Standard Jack	70 and 10
Mch., cut thread, flat head	50 and 10
Mach., cut threal, round head	50 and 10 and 10
Mch., cut thread, fillister hd.	40 and 40 and 10
Mch. rolled thread, flat head or round head	80 and 10
Set screws, iron	75 and 10 and 10
Set screws, steel, per cent advance over iron	25
Square head cap screws	70 and 10 and 10
Hexagon head cap screws	70 and 10 and 10
Fillister head cap screws	60 and 10 and 10
Flat head wood screws	10 and 10 and 5
Round head wood screws	10 and 10 and 5

IRON AND STEEL PRICES

Corrected up to Tuesday noon

WROUGHT STEEL CAR WHEELS

33-inch engine truck wheels	$22.50
36-inch engine truck wheels	23.50
33-inch tender wheels	18.50
36-inch passenger train car and tender wheels	21.50
33-inch freight car wheels	15.50

All with standard 2½ inch rims and minimum standard hubs, usual extras applying for thicker rims and larger hubs; all f. o. b. cars, Pittsburgh.

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	1.55c to 1.60c

TWISTED REINFORCING BARS

(Soft steel, Pittsburgh mill.)

¼-inch and larger	1.15c to 1.20c
5/16-inch	1.20c to 1.25c
½-inch	1.55c to 1.60c
5/8-inch	1.40c to 1.45c
¾-inch	1.65c to 1.75c

WIRE ROPE

Galvanized, iron and steel	47½ and 2½
Bright, iron and steel	55 and 2½

COLD ROLLED STRIP STEEL

(Subject to regular extras.)

Base price Cut to length		0.10 to 0.19 Carbon
Hard.	Soft.	1½ in. and wider.
2.85	3.10	0.100 and thicker.
2.95	3.20	0.050 to 0.099 inc.
3.10	3.35	0.035 to 0.049 inc.
3.35	3.75	0.031 to 0.034 inc.
3.60	4.00	0.025 to 0.030 inc.
3.80	4.20	0.020 to 0.024 inc.
4.70	5.20	0.017 to 0.019 inc.
5.10	5.60	0.015 and 0.016
5.95	6.45	0.013 and 0.014
6.55	7.05	0.012
6.90	7.40	0.011
7.25	7.75	0.010
Coils		
2.75	3.00	0.100 and thicker
2.80	3.05	0.050 to 0.099 inc.
2.95	3.20	0.035 to 0.049 inc.
3.10	3.50	0.031 to 0.034 inc.
3.20	3.60	0.025 to 0.030 inc.
3.30	3.70	0.020 to 0.024 inc.
3.60	4.10	0.017 to 0.019 inc.
4.00	4.50	0.015 and 0.016
4.70	5.20	0.013 and 0.014
5.05	5.55	0.012
5.40	5.90	0.011
5.75	6.25	0.010

CAST IRON PIPE

Three to 20 in., Cleveland	$21.50
Twenty-four to 48-inch, Cleveland	21.00
Four-inch, water, Chicago	26.00
Six to 12 inches, Chicago	24.00
Larger sizes, Chicago	23.50
Six-inch, water, New York	20.50 to 21.00
Four-inch, water, Birmingham	19.50
Six-inch and larger, Birmingham	19.50

Gas pipe, $1 per ton higher than water.

WAREHOUSE PRICES

Steel bars, Chicago	1.65c
Steel bars, Cleveland	1.80c
Steel bars, Cincinnati	1.70c to 1.85c
Steel bars, Philadelphia	1.70c to 1.75c
Steel bars, New York	1.80c
Steel bars, St. Louis	1.70c
Iron bars, Chicago	1.65c
Iron bars, Cleveland	1.75c
Iron bars, St. Louis	1.65c
Iron bars, Cincinnati	1.65c to 1.75c
Iron bars, Philadelphia	1.70c
Iron bars, New York	1.65c to 1.70c
Hoops, Chicago	2.15c
Shapes and plates, Chicago	1.75c
Shapes and plates, Cleveland	1.90c
Shapes and plates, Cincinnati	1.80c to 1.90c
Shapes and plates, St. Louis	1.80c
Shapes and plates, Philadelphia	1.70c to 1.75c
Shapes and plates, New York	1.85c
No. 10 blue ann. sheets, Chgo	1.95c
No. 10 blue ann. sheets, Cleve.	2.05c
No. 10 blue ann. sh., St. Louis	2.00c
No. 10 blue ann. sheets, Cinci.	1.95c
No. 28 black sheets, Chgo	2.55c
No. 28, black sheets, Cleveland	2.45c
No. 28 black sheets, Cincinnati	2.45c to 2.55c
No. 28 black sh., St. Louis	2.55c
No. 28 galv. sheets, Chgo	3.55c
No. 28 galv. sheets, Cleveland	3.35c
No. 28 galv. sheets, Cincinnati	3.40c to 3.55c
No. 28 galv. sheets, St. Louis	3.55c

Freight Rates, Coke

Connellsville regions, per 2,000 lbs., to:—

Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.70
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley Furnaces	1.20
Cincinnati	2.00

IRON AND STEEL SCRAP

(Net Tons.)

No. 1 railroad wrought, Chgo.	$ 7.50 to 7.75
No. 1 railroad wrought, Cleve.	9.00 to 9.50
No. 1 railroad wrought, St. L.	7.25 to 7.50
No. 1 railroad wrought, Cinci.	8.00 to 8.50
No. 2 railroad wrought, Chgo.	7.00 to 7.25
No. 2 railroad wrought, St. L.	7.00 to 7.25
Arch bars and transoms, Chgo.	10.50 to 11.00
Arch bars and transoms, St. L.	10.50 to 11 00
Knuckles, coup. & spr'gs, Chgo.	8.75 to 9.00
Knuckles, coup. & spr'gs, St. L.	8.25 to 8.50
Shafting, Chicago	11.50 to 12.00
Shafting, St. Louis	12.50 to 13.00
Steel car axles, Chgo	10.50 to 11.00
Steel car axles, St. Louis	10.25 to 10.50
Locomotive tires, Chicago	9.00 to 9.50
Locomotive tires, St. Louis	8.25 to 8.75
Cut forge, Chicago	7.00 to 7.25

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11.6 cents
Baltimore	14½ cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Minneapolis and St. Paul	32 cents
Denver	68.6 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, (all rail)	80 cents
Pacific coast, via Panama can'l	41 cents

Pipes and flues, Chicago	$ 5.75 to 6.00
Pipes and flues, Cleveland	7.25 to 7.75
Pipes and flues, St. Louis	5.25 to 5.50
No. 1 cast, Chicago	9.00 to 9.25
No. 1 cast, Cleveland	9.50 to 10.00
No. 1 cast, Cincinnati	8.50 to 9.00
No. 1 cast, St. Louis	9.00 to 9.50
No. 1 busheling, Chicago	6.50 to 6.75
No. 1 busheling, Cleveland	8.00 to 8.25
No. 1 busheling, Cincinnati	5.75 to 6.25
No. 1 busheling, St. Louis	6.75 to 7.00
No. 2 busheling, Chicago	5.25 to 5.75
No. 1 boiler plate, cut Chgo.	5.50 to 5.75
No. 1 boiler plate, cut, Buffalo.	9.00 to 9.50
No. 1 boiler plate, cut, St. L.	5.50 to 6.00
Boiler punchings, Chicago	8.25 to 8.75
Cast borings, Chicago	4.75 to 5.00
Cast borings, Cleveland	5.50 to 5.75
Cast borings, Cincinnati	4.25 to 4.75
Cast borings, St. Louis	3.50 to 4.00
Machine shop turnings, Chgo.	4.50 to 4.75
Machine shop turnings, Cleve.	5.00 to 5.25
Machine shop turnings, Cinci.	4.25 to 4.75
Machine shop turnings, St. L.	4.00 to 4.50
Malleable agl., Chicago	7.50 to 7.75
Malleable agricultural, St. Louis	6.25 to 6.50
Malleable, railroad, Chicago	7.75 to 8.25
Malleable, railroad, Cincinnati	6.50 to 7.00
Malleable, railroad, St. Louis	6.25 to 6.50
Angle bars, iron, Chgo	10.75 to 11.00
Angle bars, iron, St. Louis	9.50 to 10.00
Angle bars, steel, Chgo	7.75 to 8.00
Angle bars, stel, St. Louis	8.75 to 9.00
Stove plate, Chicago	8.25 to 8.50
Stove plate, Cleveland	7.50
Stove plate, Buffalo	9.00 to 9.75
Stove plate, Cincinnati	6.50 to 7.00
Stove plate, St. Louis	8.25 to 8.75
Bundled sheet, Cincinnati	4.00 to 4.50

(Gross Tons.)

Heavy melting steel, Pbgh.	$10.00 to 10.25
Heavy melting steel, Buffalo	10.00 to 10.50
Heavy melting steel, Chicago	8.50 to 9.00
Heavy melting steel, Cleveland	8.50 to 9.25
Heavy melting steel, Cincinnati	9.00 to 9.50
H'vy melting steel, eastern Pa.	9.50
Heavy melting steel, New York	7.50 to 7.75
Heavy melting steel, St. Louis	10.50 to 11.00
Bundled sheet, Buffalo	6.25 to 6.50
Grate bars, Buffalo	9.00 to 9.25
Grate bars, New York	6.50 to 7.00
No. 1 railroad wr'ght, east. Pa.	11.00 to 11.50
No. 1 railroad wrought, Pbgh.	10.00 to 10.50
No. 1 R. R. wght., New York	9.00 to 9.50
No. 1 R. R. wrought, Buffalo	10.00 to 10.50
Shafting, New York	12.00 to 12.50
Wrought pipe, New York	7.25 to 7.50
Wrought pipe, eastern Pa.	9.25 to 9.75
Mch. shop turnings, New York	5.00 to 5.25
Machine shop turnings, Buffalo	5.50 to 6.00
Mch. shop turnings, Pbgh.	7.85 to 8.00
Mch. shop turnings, eastern Pa.	7.75 to 8.00
Cast borings, New York	5.00 to 5.25
Cast borings, eastern Pa.	7.75 to 8.00
Cast borings, Buffalo	6.00 to 6.50
Cast borings, Pittsburgh	8.00 to 8.50
Stove plate, (Jersey points)	8.00 to 8.50
Stove plate, Pittsburgh	9.00
Stove plate, eastern Pa.	8.00 to 8.50
Shoveling steel, Chicago	7.25 to 8.00
Shoveling steel, St. Louis	7.50 to 7.75
Reroll'g rails, 5 ft. & ov., Pbgh.	12.50 to 12.75
Reroll. rails, 5 ft. & ov., Chgo.	9.50 to 9.75
Reroll. rails, 5 ft. & ov., Cleve.	11.00 to 11.50
Reroll. rails, 5 ft. & ov., E. Pa.	11.00 to 11.50
Reroll. rails, 5 ft. & ov., St. L.	10.00 to 10.25
Steel rails, short, Chicago	9.00 to 9.50
Steel rails, short, Cleveland	11.00 to 11.50
Steel rails, short, St. Louis	9.50 to 9.75
Iron rails, Cleveland nom.	11.75 to 12.00
Iron rails, Cincinnati	10.25 to 10.75
Iron rails, eastern Pa.	13.50 to 14.00
Iron rails, St. Louis	10.00 to 10.25
Iron rails, Pittsburgh	13.00 to 13.50
Frogs, switches, guards, Chgo.	8.75 to 9.00
Frogs, switches & g'rds, St. L.	9.25 to 9.50
Car wheels, (iron), Pittsburgh	11.25 to 11.50
Car wheels, (steel), Pittsburgh	12.50 to 12.75
Car wheels, Chicago	10.00 to 10.25
Car wheels, eastern Pa.	9.50 to 10.00
Car wheels, Buffalo	10.50 to 11.00
Car wheels, (N. J. points)	9.25 to 9.50
Car wheels, St. Louis	10.00 to 10.25
Iron axles, Pittsburgh	20.00 to 21.00
Iron axles, Cincinnati	19.00 to 20.00
Iron axles, eastern Pa.	18.50 to 19.00
Iron axles, Buffalo	19.00 to 19.50
Iron axles, Chicago	15.50 to 15.75
Steel car axles, New York	12.00 to 12.50
Steel car axles, Buffalo	12.00 to 12.50
Steel car axles, Cleveland	12.00 to 12.50
Steel car axles, eastern Pa.	13.00 to 13.50
No. 1 busheling, Buffalo	8.25 to 8.75
No. 1 busheling, Pittsburgh	9.00
No. 2 busheling, Buffalo	5.75 to 6.25
Low phosphorus steel, Buffalo	14.00 to 14.50
Low phosphorus steel, Pbgh.	13.50 to 14.00
Low phos. steel, eastern Pa.	13.50 to 14.00
No. 1 forge, eastern Pa.	8.00 to 8.25
No. 1 cast, eastern Pa.	11.00 to 11.50
No. 1 cast, Pittsburgh	11.00 to 11.50
No. 1 heavy cast (N. J. points)	10.50 to 11.00
Mall. iron, agricul., Cleveland	9.00 to 9.50
Mall. iron R. R., Cleveland	9.25 to 9.75
Malleable, railroad, Pittsburgh	9.50 to 10.00
Mall. R. R., Buffalo	9.25 to 9.75
Mall., R. R. east. Pa.	9.00 to 9.50
Bundled sheet, Pittsburgh	8.00 to 8.50
Bundled sheet, Cleveland	7.50

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COLUMBUS, OHIO

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Light Stampings We also polish, plate or enamel these if desired.
The Chandler Co. Springfield, Mass.

Making Malleable Castings

(*Continued from page* 914.)

duced uniformly and continuously—which means careful firing, closed furnace doors, and properly regulated top-blast where this is used. With a good furnaceman charging his fuel close to the door, allowing it to coke partially and then spreading it over the fuel bed, all this being done like clockwork, the least interruption of the continuous flame results, and melting is done quickly. Again, with a good malleable melter, who realizes that he is not making steel, with the necessary reactions in the bath to be provided for, but that he has simply to melt the iron and do this as rapidly as possible, all of which means lots of rabbling and mixing of the bath to bring it up to heat quickly and uniformly, it is pretty certain that with a proper silicon content to start with, the "test plug" when it is taken after the first skimming off of the slag, will show up a good fracture, and the subsequent time required will simply be that necessary to get the metal hot enough for proper pouring requirements.

The "low" iron above mentioned is the most dangerous thing encountered in malleable practice, for when this is charged in the annealing ovens and receives the intense heat treatment given the regular work, it comes out positively "rotten" as the technical term has it. The fracture will be a dull gray, occasionally striped with colored bands and then called "calico" iron, and so weak that it falls below the poorest grades of gray iron castings. Naturally this metal is unsafe for any purpose, and considering how readily the very best of pig irons when improperly mixed will give such poor results, while with correct silicon content and proper furnace practice they will give the highest grade of malleable, it is little wonder why no one but the thoroughly posted malleable man can explain failures in castings made by reputable producers.

In open-hearth practice, the same attention is necessary to charging and firing. Here, however, the action is far quicker, and much closer attention is necessary. Here also is noticed the unfortunate effect of the steel melter's methods of working, as the charges are gotten in any old way, the mixed up heat is allowed to simmer down into a bath which cannot be stirred up with iron bars easily, and when finally the test plug shows signs of oxidation by the succession of pin holes along the rim, and the white fracture is mushy and irregular, ferro-silicon is now added to correct (?) the trouble and bring the heat back to the proper point. The result is always weak iron, comparatively speaking, as the ferro-silicon restored the silicon but does not remove the oxygen present at the temperatures existing.

From a life experience in "malleable" and a consulting practice in this line extending all over the country, the author can conscientiously say in nine cases out of ten the troubles experienced in the production of malleable castings are traceable to long drawn out heats resulting in oxidized metal which cannot be made to anneal properly.

Annealing Practice

Attention must be drawn to the annealing process at this point. All scientific investigations published on this process have given out unreliable results. The tests made were always on small specimens annealed in small furnaces, and it is stated that 1,500 odd degrees Fahr. are required to bring about the carbon conversion necessary to give the "black heart" fracture in the annealed piece. This is correct enough for cupola iron, which was never used for the tests. The facts of the case are that the conversion in the ordinary malleable process takes place as low as 1,250 degrees Fahr., though the best point is 1,350 degrees. Be it stated that the temperature should be taken at the coldest point of the coldest pot in the oven, and not the oven temperature. This

would mean that with proper oven construction the hottest point of the pots would run about 1,450 degrees and the clear space above the pots in the oven might run about 1,650. But the castings themselves will not have received more than 1,250 to 1,450 degrees.

Now it is known that the same conversion of the carbons can be obtained at higher temperatures, and hence it is possible to get fairly satisfactory results this way, provided the annealing period is shortened very materially. This is the basis of all the "quick anneal" methods patented and tried, which all have and will fail simply because of the impossibility of obtaining uniform hard castings. We are again brought back to the variation in the physical constitution of the metal due to a greater or less oxidation from long or short heats.

It is needless to say that if the proper annealing temperatures are not given the castings, bad results will eventuate. A good piece of malleable shows a thin white rim or skin, then a narrow band of gray color (corresponding to the crystalline portion set at right angles to the surfaces by the chilling action of the damp sand of the mold), and the interior a clean soft black. If the skin is too thick, or the black is not right or the corners are wasted away, with good furnace work, the anneal may have been off. Giving the castings an insufficient temperature lets them come out "under-annealed", which can be remedied by packing them into the next set of pots for another anneal. If the ovens were run too hot—as for instance on the figures published in investigations—and for the regular period, the castings would come out "over-annealed", brittle, with deep white skin, and very poor material, though not as bad as the previously mentioned "low" iron.

There are many further points which would interest the specialist in the manufacture of malleable castings, but would seem to fall without the scope of this article. The reader is referred to the standard literature for them. But it should be mentioned that a malleable establishment is about four times as expensive to build as a gray iron foundry of corresponding tonnage, the competition is closer than for gray iron castings, the chances of losses far greater through imperfect practice, and the entry into the field at the present day only advisable when the tonnage required is large, or deliveries are poor for that district.

The Krahn Manufacturing Co., Milwaukee, has issued a six-page bulletin describing its new force feed lubricator, which is built for installation on oil engines, steam engines, air compressors, pumps, etc. This lubricator is designed to deliver measured quantities of oil to the various bearings, in order to secure the maximum efficiency of lubrication with a minimum consumption of oil. Various features of the lubricator are fully covered in the bulletin.

Among the new publications which recently have been issued by the Bureau of Mines, Washington, D. C., are the following: "The Origin of Coal," by David White and Reinhardt Thiessen; "Experiments with Furnaces for a Hand-fired Return Tubular Boiler," by S. C. Flagg; "Factors Governing the Combustion of Coal in Boiler Furnaces, a Preliminary Report," by J. K. Clement, J. C. W. Frazer and C. E. Augustine; "Accidents from Falls of Rocks and Ore," by Edwin Higgins.

An interesting wall poster on the care of chains and the prevention of accidents in connection with hoisting accessories has been issued by William E. Volz, 126 Liberty street, New York. In addition to suggestions regarding the prevention of accidents, these are tables giving the safe load for chains and slings of various sizes, together with interesting information regarding chain hooks and the methods of manufacturing the Gartscherrie weldless chain.

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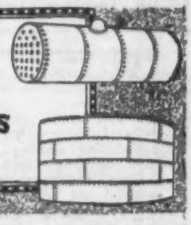

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